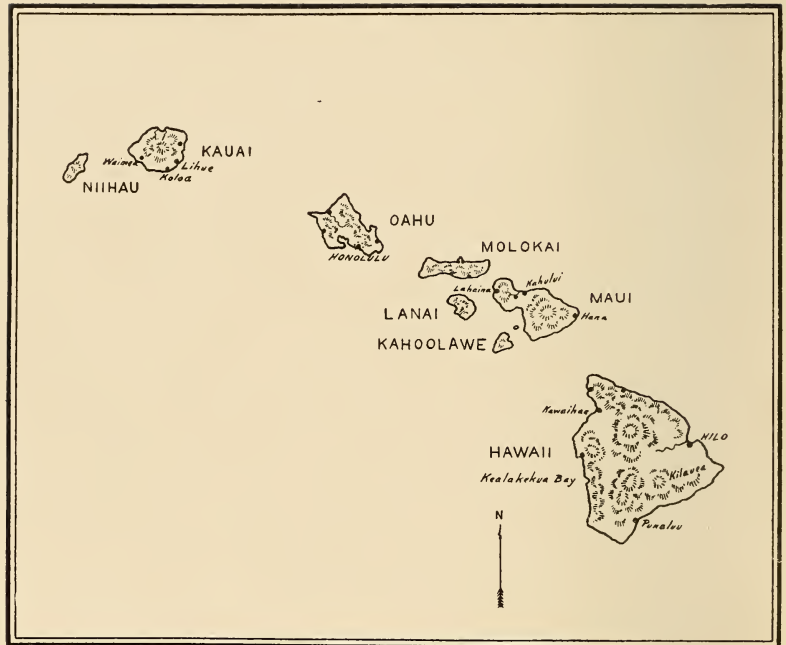


THE PATH OF THE DESTROYER







HAWAIIAN ISLANDS.

Discovered by John Gaetano, Spanish navigator, about the year 1555, on one of his voyages between Acapulco and Manila.

Named by him the "Mesa Islands." Their exact position was hidden from other European nations by the Spaniards, for 223 years.

On January 18, 1778, Captain James Cook, R. N., re-discovered the Islands. The islands of Niihau and Kauai were the first lands seen.

The Hawaiian Islands extend through four degrees of latitude, $18^{\circ} 30' N$ to $22^{\circ} 30' N$; and six degrees of longitude, $154^{\circ} 30' W$ to $160^{\circ} 30' W$.

The total area of all the islands, large and small, is some 6,454 square miles; and they possess a climate "Second to None" in the universe for healthfulness.

“THE PATH OF THE DESTROYER”

A HISTORY OF LEPROSY IN THE
HAWAIIAN ISLANDS

AND

THIRTY YEARS RESEARCH INTO THE MEANS BY
WHICH IT HAS BEEN SPREAD

BY

Arthur
A. A. St. M. MOURITZ

FORMERLY PHYSICIAN TO THE LEPER SETTLEMENT,
MOLOKAI.

FOUR MAPS AND SIXTY-NINE ILLUSTRATIONS,
COLORED AND PLAIN.

HONOLULU.
1916

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THIS
THE FIRST AMERICAN BOOK ON
HAWAIIAN LEPROSY
IS
RESPECTFULLY DEDICATED

TO

The noble hearted members of the 58th Congress,
who generously answered the pleadings of the
Hawaiian people for aid to the afflicted of their
race, and appropriated the necessary funds to es-
tablish and maintain a Leprosarium at Kalauwao,
Molokai.



KALAUWAO.

(Modern spelling: Kalawao.)

U. S. Leprosarium buildings parallel to sea coast.

PROLOGUE.

The Hawaiians are a very affable, agreeable and lovable people, just as much so as any other on our earth; but in contact with disease, all their desirable traits are seriously discounted by their lack of care, because they endanger all of us "by failing to obey the most simple rules of health, necessary for their own salvation and self-preservation."

It is a most pitiable condition, evident to the most unobserving, "that an atmosphere of leprosy clings to and surrounds the unfortunate Hawaiian." Why? Because he fails to realize the danger that menaces him, apart even from the extreme receptivity of his system to the bacillus of leprosy, a condition lacking in other races domiciled in Hawaii nei: this being an indisputable fact, then he (the Hawaiian) is the weak link in our chain of national health defense.

It is presumably allowed that the commonwealth is the commonwealth, this being so our duty is plain, we must stand shoulder to shoulder with the Hawaiian, brace him up, and support him until he can stand alone, like other races; if he stumbles and falls we must raise him, comfort him, sustain him again, like our own brother.

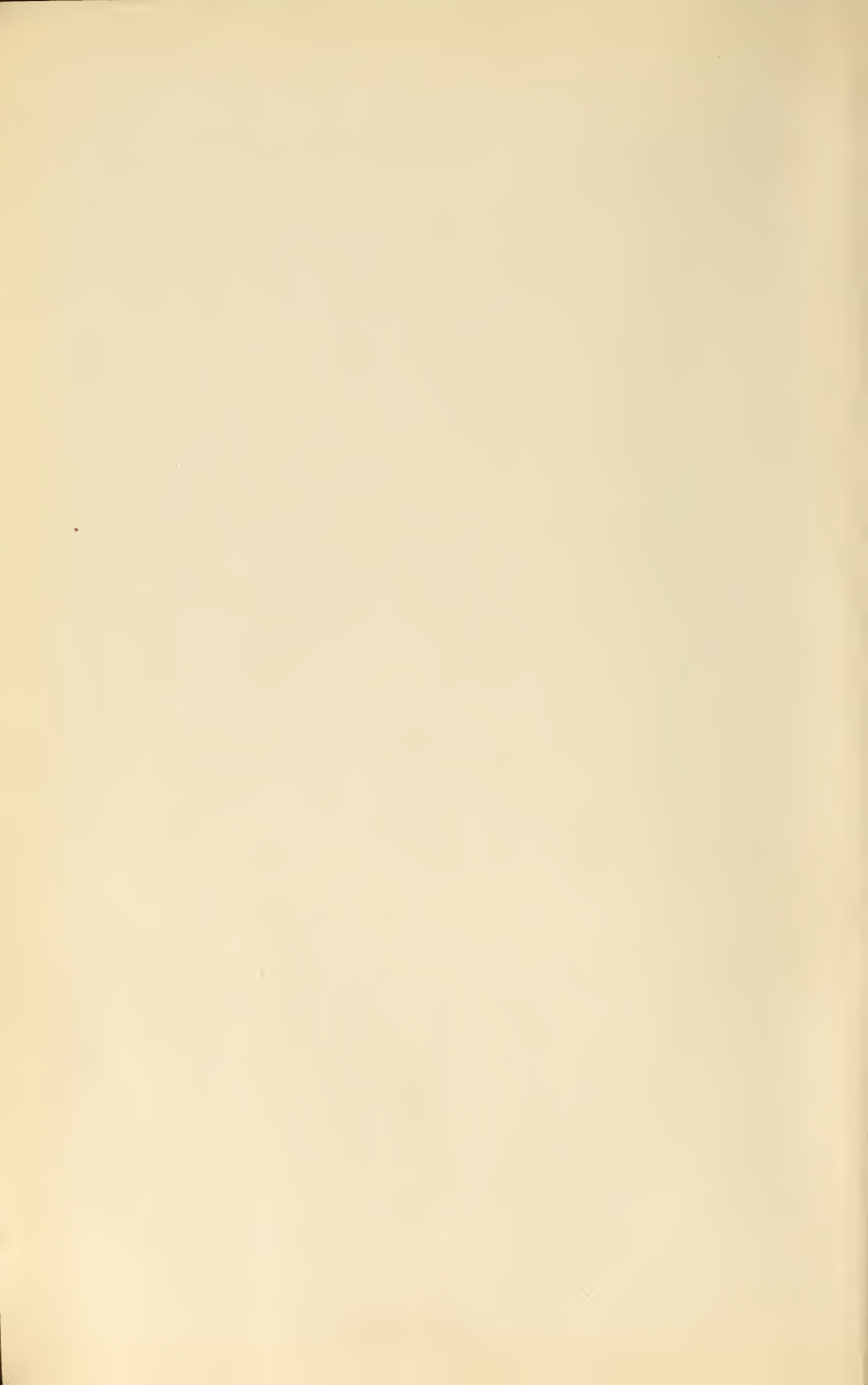
The eradication of leprosy can well begin in the school room, like other benign and essential advances; here can be instilled in virgin soil, free from the weeds of prejudice, the first principles of good health and self-preservation.

The causes of the decadence of the Hawaiian race are very complex; but the added result indicates that it is due in the main to the standard set by modern civilization, which carries in its train attendant disadvantages, to wit: New things, strange clothes and foods, housing, diseases, medicines, habit-forming drugs, etc., and alcoholic beverages.

The strain is too severe, the Hawaiian falls and drops out; he is not sufficiently fortified; because of his too brief emergence from primitive life.

Civilization blights aboriginal races, the Hawaiian is no exception; the harsh side of civilization kills by kindness, it may resemble the Greeks bearing gifts, in contact with primitive races it is treacherous.

Apart from its limitedly contagious properties, the disfiguring repulsiveness of leprosy alone demands its segregation; its specific contagion, compared to that of Tuberculosis, is less than one-tenth of one per cent.



PREFACE.

With the rapidly changing conditions in Hawaii, much valuable material relating to leprosy will soon be lost and buried in oblivion.

Because no one else has written the history of leprosy in Hawaii, I have taken up the subject, I admit, with some hesitation and misgiving.

I have also made a special and close study of the cause and means by which leprosy has been spread; the conclusions I have arrived at are stated in the pages of this book, but perhaps my statement that "Mouth Infection" is the chief means by which leprosy has been spread will not be well received; because the song of the siren of inoculation has warbled so long and loudly over the land.

I assume that my views founded on probable evidence of the cause of the propagation of leprosy in Hawaii, if accepted, will lead the Hawaiian people from the shades of darkness, also other races; and that all will be ultimately snatched from the jaws of death.

This Monograph does not cover the entire field of leprosy in Hawaii; historical, ethnical, etiological, and superficial phases of pathology, are alone dealt with.

What work I have done has been carried on in leisure moments, which I have been able to snatch from the working hours of a busy life; under many difficulties, hindrances, defective apparatus, poor quarters, and lack of assistance, skilled and unskilled. Not being a Croesus, I could only afford limited time and money.

My diction and composition are faulty and not free from platitudes. I plead that it is better to make a poor attempt than none at all, do nothing, assume a somnolent attitude, fold the hands until a little sleep comes, etc.; resulting in valuable material on leprosy vanishing forever.

The language used in this Monograph is mostly non-technical, it is intended for the laity and the professional reader.

Words not in common use are explained in the Glossary.

THE AUTHOR.

Honolulu, August 15, 1915.

I HAVE ACQUIRED MUCH VALUABLE DATA ON THE EARLY
PREVALENCE AND SPREAD OF LEPROSY IN HAWAII,
FROM THE FOLLOWING SOURCES:

ISLAND OF OAHU.

Alexander, Professor W. D. (Deceased).
Board of Health Reports.
Brickwood, Miss Louisa. (Deceased).
Dayton, David, Esq. (Deceased).
Emerson, Mrs. Ursula. (Deceased).
Fathers of the Catholic Mission.
Fitch, Dr. G. L. (Died June 4, 1904).
Forbes, Rev. A. O. (Deceased).
Hoffman, Dr. Edward. (Deceased).
Judd, Albert F., Esq. (Died May 20, 1900).
McKibbin, Dr. Robert. (Deceased).
Parke, W. C., Esq. (Deceased).
Records of the Hawaiian Board of Missions.
Trousseau, Dr. George. (Died May 4, 1894).
Whitney, H. M., Esq. (Died Aug. 17, 1904).

ISLAND OF MAUI.

Archambaux, Father Gregoire. (Deceased).
Burgermann, Father Andre. (Deceased).
Everett, T. W., Esq. (Deceased).
Fornander, Abraham, D. C. L., Ph. D. (Deceased).

ISLAND OF HAWAII.

Coan, Miss Harriet. (Died July 23, 1906).
Fathers of the Catholic Mission.
Kauhane, Rev. J. (Deceased).
Loots, Father Bonaventure. (Died March 9, 1899).
Pouzot, Father Charles. (Deceased).

ISLAND OF KAUAI.

Rowell, William. E., Esq., C. E. (Died March 18, 1916).
Wilcox, Luther, Esq. (Died July 3, 1903).

ISLAND OF MOLOKAI.

Moellers, Father Wendelin. (Died Sept. 1, 1914).
Oliver, Dr. Richard. (Died Aug. 12, 1902).
Swift, Dr. Sydney B. (Deceased).

* * *

I have made use of the work of the following persons:

Bertram, Brother, St. Louis College, Map of Molokai.
Robert, Brother, St. Louis College, Maps.
Waiamau, John, Artist, seventeen years a resident of Kalaupapa.
Williams, J. J., and C. Weatherwax, Photos and Views.

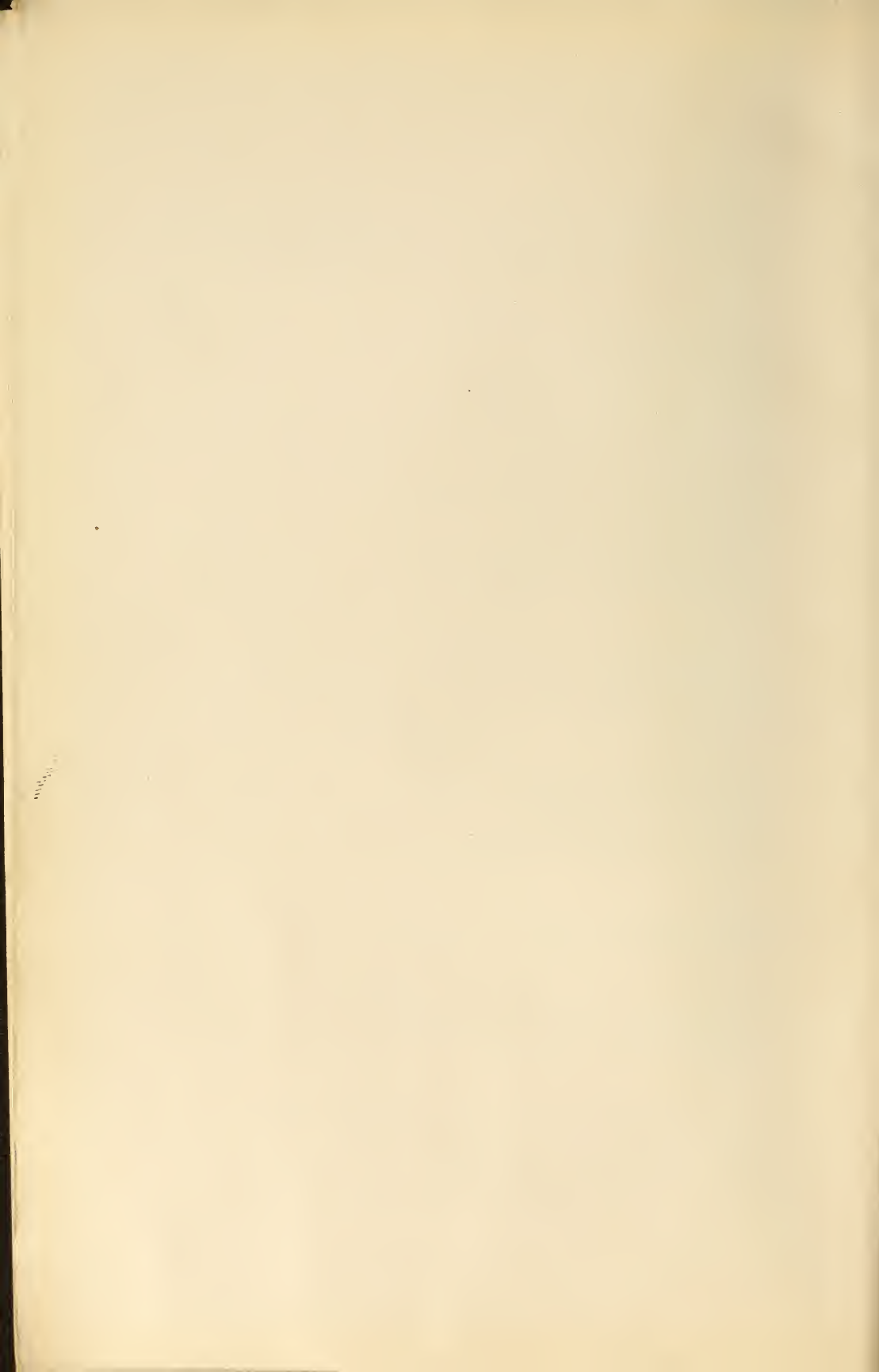


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* (k) kane or male.

* (w) wahine or female.

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PART I.

INTRODUCTION.

Much has been said and written about "THE BLOT" that leprosy is to the Hawaiian Islands; hence the inference is drawn "that many TOURISTS and other visitors have hesitated to visit Hawaii on account of the prevalence of the disease."

In order to refute this assumption, I submit the following statement, and first ask the question: Among what race is leprosy endemic? Please carefully read the following figures.

FIRST AMERICAN CENSUS, A. D. 1900				
Race	Population	Lepers	Ratio Approximate	Race Percentage Whole Population Approximate
Hawaiians....	37,635	964	1 to 39	24%
Foreigners....	116,366	63	1 to 1847	76%
Total.....	154,001	1027		100%

In India the ratio of lepers to the healthy is 1 to 1864. The above table "shows" in a total foreign population, 76% of the whole (composed of a large majority of Asiatics, and a very low proportion of Caucasians), only 63 lepers exist; whereas, the Hawaiian population, only 24% of the whole, produces 964 lepers.

These figures disclose that the foreign race is practically free from the ravages of leprosy; hence the fear of becoming infected in Hawaii need not cause alarm to any visitors, or even residents on our shores.

What can carry more conviction than these figures? If they do not convey a lesson of comparative non-leprous infection to the foreign population domiciled here, nothing that I can write will be more convincing.

The reader can also draw his own conclusions from the following story. During the years 1884, 85, 86, 87, I resided at the Leper Reservation on Molokai, and during those years I entertained twenty-seven visitors and tourists. Over forty other applicants were turned down and refused permission to enter the Reservation, the chief desire of these people being to see the lepers and take photographs.

If the Board of Health once let down the bars of entrance, they would be pestered by many applicants for admission.

When the sanitary committee of our Legislature announce they

propose to visit the Leper Settlement, they are immediately inundated with requests for steamer transportation to Molokai.

In recent years, to avoid refusals, and not offend voters and others, the date of the steamer's departure is concealed.

The applications of would-be visitors are not by any means confined to friends and relatives of the lepers. Strangers, tourists and others also apply.

About the second week of the month of July, 1907, the Pacific Commercial Advertiser records on one of its front pages the doings of one, Jack London, and his friends at the Leper Settlement.

From time to time the mainland papers have printed exaggerated and untruthful stories concerning the status of leprosy in Hawaii. It is unnecessary to reply to them; their best refutation lies in the eagerness of visitors to gain access to the Leper Settlement.

THE 'DEATH RATE OF ALL THE ISLANDS FOR THE YEAR ENDED JUNE 30, 1913, WAS 3,232: OF THIS TOTAL, ONLY 48 DEATHS WERE CAUSED BY LEPROSY, OR OUT OF EVERY 67.33 DEATHS, ONE WAS DUE TO LEPROSY.

THE DEATH RATE FROM LEPROSY PER EACH 1,000 OF THE POPULATION AMOUNTS TO 0.22. OF THE EIGHTEEN PRINCIPAL CAUSES OF DEATH, LEPROSY OCCUPIES ONLY THE 14TH PLACE WITH 48 DEATHS.

Hawaii has nothing to conceal. A final cold, clinching, deliberate fact is That SEVEN-TENTHS (7/10) per THOUSAND is the extent of the prevalence of LEPROSY amongst all FOREIGN RACES domiciled on her shores.

It is in evidence as a painful and undisputed fact that in Hawaii nei, leprosy is a scourge peculiar to the Hawaiian race, and its kindred offshoots.

It is also a singularly significant fact, that with scarcely an exception Those FOREIGNERS both MALE AND FEMALE who have acquired leprosy are those who have been in particularly promiscuous, friendly, and intimate CONTACT with Hawaiians; viz., visiting, eating, and sleeping in their homes.

It is fitting to add—Hawaii declines to receive any lepers from Continental United States or elsewhere. Our aboriginal racial material is altogether too susceptible and explosive, without

any addition of fresh tinder, to possibly kindle into activity the supply we have already on hand.

The Census of the year 1910 gave the number of Hawaiians as,

Males	13,439
Females	12,602
<hr/>	
Total	26,041
<hr/>	

Caucasian and Asiatic-Hawaiians are excluded from the above figures.

ABSTRACT OF CONTENTS.

1. The *Bacillus Leprae*, discovered by Dr. Gerhard Armauer Hansen of Bergen, Norway, in the year 1868, is a plant microscopic parasite which finds its most desirable and only habitat in the human body, and its presence and development therein produces the three forms of leprosy—(a) Nodular or Tubercular, (b) Mixed or Dual, (c) Neural or Anaesthetic.

Dr. Albert L. S. Neisser of Breslau further elaborated and added to Hansen's *Bacillus* the important features of its being *non-motile*, *non-flagellate*, and *non-sporogenous*.

2. Leprosy is limitedly contagious to the careless contact; practically non-contagious to the careful.

3. Leprosy cannot be conveyed by the breath of a leper, even if the contact is close.

4. Flies, fleas, mosquitoes, and bed-bugs may be ignored as active causative factors in spreading leprosy.

5. The *Bacillus Leprae* exists outside the body of the leper, in graves and toilets, these locations as a means of spreading leprosy may also be ignored.

6. There are carriers of leprosy, who carry the bacillus at varying intervals in certain parts of their bodies in the neural form, but infection from these foci of the disease cannot be conveyed to contacts. These carriers of leprosy are few in number, and as a factor in spreading leprosy they may be safely eliminated.

7. The main entry of the *Bacillus Leprae* into the system of man is through the *mouth* and *digestive tract*, and this is "*the path of the destroyer*."

8. The *mouth* and its contained fluid, the saliva, is for all practical purposes, the source of contagion to the healthy.

9. Leprosy as a hereditary affection is of doubtful proof, and also hereditary predisposition (so-called); nearly all such cases can be explained as being post-natal infection.

10. Leprosy cannot be inoculated upon any dermal surface by ordinary means in man (in my experience), but the fetich of inoculation will not down in this community—it dies hard.

11. Leprosy is not a disease of animals. They are not receptive to inoculation on dermal or mucous surfaces. They are apparently inoculable by intraperitoneal injections of the blood serum from dermal blisters or bullae. Feeding leper serum mixed with fresh pancreatic juice of the pig, together with previous alkaliniza-

tion of the gastric juice, and administered to certain animals, produces a disease resembling human leprosy in some cases as early as four months.

12. The blood per se is not a permanent habitat of the *Bacillus Leprae*.

13. Vaccination performed aseptically, or even septicly, fails to fill the bill as a cause of spreading leprosy.

14. Salt fish, raw fish, poi and awa cannot convey or communicate leprosy unless contaminated by leprous contact.

15. A "de novo" development of leprosy cannot occur.

My apology and justification for coming to the front and inflicting the before mentioned statements on the public, is contact and practical acquaintance with nearly 4,000 cases of leprosy.

Thirty years ago, by request of the (then) Board of Health, I wrote a report on leprosy, very much against my own will. My views at that time were crude, immature, and in the main theoretical, whereas today I am in possession of extensive experience and facts.

INCUBATION

The incubation of leprosy is the most difficult to fix of any known disease; the victim may suspect where, but rarely when he became infected. The necessary work to obtain definite information on this phase of leprosy is enormous; one investigator cannot possibly reach reliable results. In the 1,100 cases of conjugal relation mentioned on another page, I could obtain only nine wherein it was possible to draw any partially accurate conclusion.

One.—Length of incubation.....	5 months.
Four.—Length of incubation.....	8 to 12 months.
Three.—Length of incubation.....	12 to 15 months.
One.—Length of incubation.....	15 to 20 months.
Minimum length of incubation, average.....	10 months.
Maximum length of incubation, average.....	15 $\frac{2}{3}$ months.



KING KAMEHAMEHA V.

Born December 11, 1830. Died December 11, 1872.

Before ascending the throne known as Prince Lot. He had acted as president of the Board of Health before becoming King. On December 28, 1863, the first official mention of leprosy came up at a Board of Health meeting, on the request of the King.

As King Kamehameha V, he signed and approved the "Act to Prevent the Spread of Leprosy," on January 3, 1865. He ascended the throne November 30, 1863.

CHAPTER I.

LEPROSY IN HAWAII

No indigenous word for leprosy exists in the Hawaiian language.

The exact date when leprosy first appeared in the Hawaiian Islands cannot be exactly determined; it is only possible to surmise when it did, and in the absence of absolute facts, it is the only course open.

There is no word in the Hawaiian vocabulary for leprosy. "*Mai Pake*," or Chinese Sickness, is generally in use to define leprosy; also "*Mai Alii*" (the chief's sickness), but it is doubtful if this name (*Mai Alii*) strictly is intended to define leprosy; it more properly fills the condition to which we apply the word *scrofula*.

It is reasonable to assume that this word "*Mai Pake*" has some connection with the Chinese and leprosy, under two conditions. Either some Chinaman presented visible evidence of the disease to the Hawaiians, or else on interrogation, the Chinese stated they were conversant with leprosy and had it in China.

Chinese visited Hawaii in various ships subsequent to the year 1830. The first Chinese coolie emigrants from Hong Kong landed at Honolulu January 25, 1852.

The name "*Mai Pake*" does not necessarily presuppose that the Chinese introduced leprosy into Hawaii, it simply assumes the Chinese connection with the word. Abundant and conclusive evidence, however, exists that the Chinese coolie has carried leprosy into other countries. There is scarcely a leper hospital in the West Indies and South America that has not had a Chinese leper inmate.

I admit that the mere fact that there is not a distinctive word in the Hawaiian language for leprosy argues nothing, but I also assert, from many years' contact with the Hawaiian people, that when they are in doubt or perplexity about new words, they naturally turn to the foreigner for aid—all thinking people will admit this. History repeats itself—look back twenty-five years, where does the Hawaiian language derive such words as "*Mai Bubonica*," year 1899 (bubonic plague); "*Mai Kolera*," years 1895, 1911 (cholera); "*Piva Lenalena*," year 1911 (yellow fever)? Due importance should be attached to this clear evidence.

Discussing this same question at Kaunakakai, Molokai, in the year 1885, with the late Professor W. D. Alexander, a brilliant and logical mind, yet withal a most unobtrusive, modest, and silent gentleman, I stated my case, on the cause of using the word *Mai*

Pake as outlined above, and asked the Professor what he thought of it. He answered: "All you state is probable, tenable, convincing, and, short of absolute proof, you make out a strong and plausible case."

Some thirty-five years ago, discussion on the question of the origin of leprosy in Hawaii came prominently to the fore. Those who maintained that the Chinese origin of Hawaiian leprosy was vague and uncertain argued and stated their views as follows:

"It has been asserted that leprosy was introduced by a Chinaman, and consequently was called *Mai Pake*, or Chinese Sickness, as the Hawaiians had no name for the disease.

"First. How is it that one Chinaman caused such a spread of the disease thirty or forty years ago—1856 or 1846?

"Second. If the disease was introduced by the Chinese in proportion to their intimate contact and association with Hawaiian females (especially young girls), we should expect to find a larger proportion of females than males affected with leprosy, and yet we all know the contrary is the fact."

The answer to the first statement is: Nowhere do the upholders of the Chinese connection with leprosy assert, that China was the sole origin of the disease in these islands.

Possibly Hawaii was infected from more than one source. Leprosy may have been carried to the islands by the varied and mixed peoples which comprised the crews of the numerous whale ships, said crews being recruited at ports of the Azores and Cape de Verde Islands, East and West Coasts of Africa, Mozambique, India, West India Islands, and Malayasia; almost all these countries are seats of endemic leprosy.

The answer to the second allegation, "the intimate and close association of the Chinese with young Hawaiian girls as a possible cause of spreading leprosy." This statement presupposes and asserts that leprosy is conveyed by inoculation, like syphilis, which is an absurdity—in fact, leprosy even in the conjugal relation is the least likely to be communicated of any disease that can be said to be so conveyed, and cannot be compared with syphilis and tuberculosis in this respect.

Nine years after Capt. Cook rediscovered the islands (1778), Hawaiians visited China. Chief Keawe Kaiana and three Hawaiians sailed for Canton, China, in August, 1787, with Captain Meares in the "*Nootka*," and remained there three months. Kaiana and other Hawaiians visited China again in 1788, in the "*Iphigenia*" and "*Felice*."

CHAPTER II.

EARLIEST KNOWLEDGE OF LEPROSY IN HAWAII

The best, most capable, reliable, and earliest accounts of diseases in Hawaii are from the pens of the early American missionaries; the pioneer pilgrims of this mission arrived at Kawaihae, island of Hawaii, March 30, 1820, landing from the "Thaddeus." Twelve successive companies came to Hawaii over a period of twenty-eight years, ending in the year 1848.

These gentlemen wrote freely and ably, and were keen observers of the diseases of the Hawaiians, their food, their morals, customs, habits, and methods of living.

The Rev. Charles Samuel Stewart landed at Honolulu, Oahu, April 27, 1823. In Volume I, page 163, will be found the following entry in his record of daily events of date May 22, 1823, twenty-five days after his arrival in Honolulu.

"Not to mention the frequent and hideous marks of a scourge, which more clearly than any other, proclaims the curse of a God of purity, and which, while it annually consigns hundreds of this people to the tomb, converts thousands while living into walking sepulchres. The inhabitants generally are subject to many disorders of the skin; the majority are more or less disfigured by eruptions and sores, and many are as unsightly as *lepers*. The number of either sex, or any age, who are free from blemishes of this kind is very small, so much so that a smooth and unbroken skin is far more uncommon here than the reverse is at home.

"July 4, 1823. Indeed, we seldom walk out without meeting many whose appearance of misery and disease is appalling, and some so remediless and disgusting that we are compelled to close our eyes against a sight that fills us with horror. Cases of ophthalmia, scrofula, and elephantiasis are very common."

The prevalence of disease amongst the Hawaiian people ninety-two years ago clearly indicates that the Hawaiian race must then have been grievously stricken with many skin and blood maladies, and possibly leprosy.

In the year 1810 the Island of Oahu had sixty foreign residents, of many varied nationalities.

The population of the Hawaiian Islands at the census in the year 1823, was 142,050—all aboriginal Hawaiians. I have previously stated the pure Hawaiian population, per United States census in the year 1910, was 26,041 souls; these figures show a

decrease in the Hawaiian race of 116,009 in eighty-seven years, at the rate of about 1,333 per annum.

Mr. Brickwood, a resident of Honolulu, at one time postmaster, recognized in the year 1840, the disease of one Ahia as leprosy—he was chief in the bodyguard of Kamehameha III. Mr. Brickwood had prior knowledge of the disease in Egypt.

Ahia's case attracted much attention, from the prominent office he held, also because he was very popular and much beloved. He died in the year 1856; his wife died in the year 1860, she was not a leper.

George Naea, the husband of Queen Emma's mother, was a leper in the year 1838; he died in 1854. His wife was not a leper.

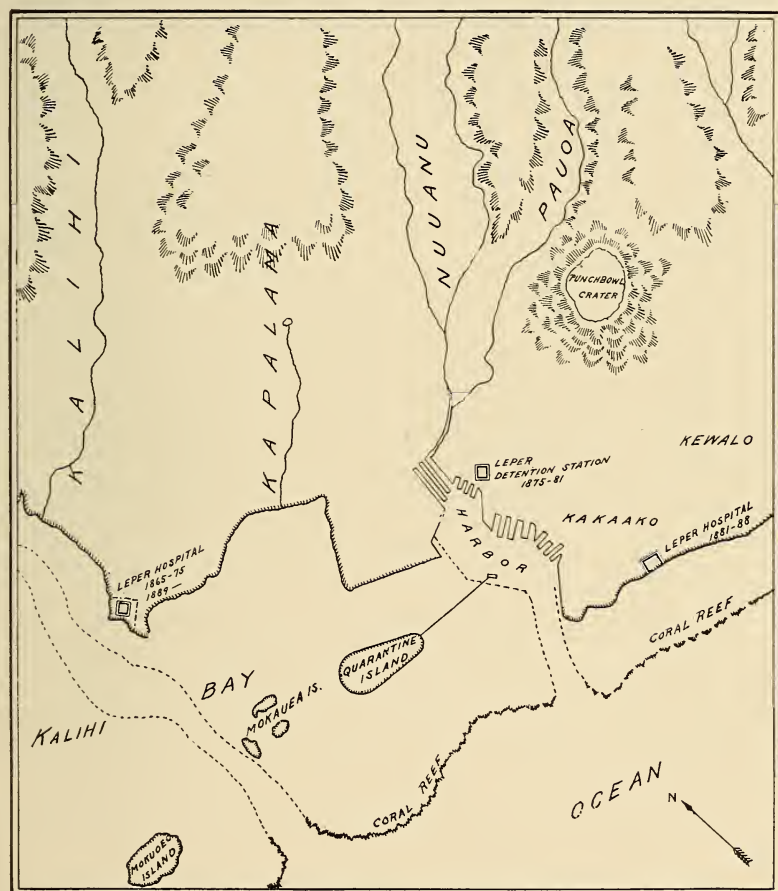
Honolulu, a man residing in Nuuanu Valley, was a leper in the year 1839; he died in the year 1860. Mary, his wife, never contracted the disease and was living in the year 1884 at Moanalua, Oahu.

In the year 1835 Kamuli, a Hawaiian woman, was living at Koloa, Island of Kauai, and there developed leprosy. She died in the year 1848, at Waiohinu, Kau, Hawaii. Her husband remained free from the disease until the time of his death in 1857; but her sister, and two half-brothers had become lepers before the year 1838.

I have selected these few cases of leprosy because their history was well authenticated; the description of them clearly indicates that the Nodular form was the disease in evidence (swollen, lumpy face, large and pendulous ears, no eyebrows, large, swollen hands and feet, and peculiar musty, offensive odour from their persons). To my mind, this is clear proof that leprosy prevailed to a moderate extent in Hawaii as early as the year 1830; also that some of the "remediless and disgusting cases" observed by the Rev. Charles Stewart in the year 1823 were quite possibly a double combination of diseases, to wit, leprosy and syphilis.

The history of the foregoing cases of leprosy comes from highly reliable sources, viz.: Professor W. D. Alexander, Rev. Sereno Bishop, D. D., Luther Wilcox, James Dowsett, Dr. Robert McKibbin, and Miss Louisa Brickwood. All these persons are now dead.

Dr. Hillebrand, an able and accomplished German physician, observed Chinese coolies affected with leprosy in Honolulu in the year 1848. However, positive evidence free from a shadow of doubt is still lacking as to *how, when, and from whence?* leprosy invaded Hawaii.



MAP OF HONOLULU.

Kalihi Leper Hospital, left foreground. Kakaako Leper Hospital, right foreground. Leper Detention Station, middle foreground.

About the year 1864 the rapid spread and great increase of leprosy began to alarm the community, and steps were taken to check the spread of the disease by segregation; and on the 3rd day of January, 1865, the law "To prevent the spread of leprosy" was enacted by the Legislature of the then Kingdom of Hawaii.

Honolulu was officially declared a city on August 30, 1850. On December 13, 1850, the first Board of Health was organized by order of King Kamehameha III, by and with the advice of his Privy Council. The members of the board were composed of Dr. T. C. B. Rooke, Dr. Geo. A. Lathrop, C. Hoffman, M. D., Benjamin F. Hardy, G. W. Hunter, Richard Hill Smith, and W. Newcomb—seven members, four to act as a quorum.

It was not until thirteen years afterwards that the subject of leprosy came to be discussed by the Board of Health. In the year 1863 the report of Dr. Hillebrand, of the Queen's Hospital, for the month of April, calls attention to the rapid spread of the new disease, called "Mai Pake" by the Hawaiians. The Doctor terms the disease genuine Oriental leprosy. At a meeting of the Board of Health held on December 28, 1863, a report of the Mai Pake (Chinese disease) came up for the *first* official discussion. Prince Lot, when holding office as Minister of the Interior, presided as president of the Board of Health—he afterwards became King Kamehameha V.

At a Board of Health meeting held February 10, 1864, it was brought out that leprosy was spreading on the "other islands," a census of lepers was ordered and the medical members of the Board of Health, Dr. Hoffman and Dr. Hillebrand, were requested to go into the question of heredity, contagion, first origin, and similar causes.

At a Board of Health meeting held May 25, 1864, "Mai Pake" was again discussed.

A letter published in the "Pacific Commercial Advertiser," May 21, 1864, reports rapid spread of leprosy in Kona, Hawaii, and advises that immediate steps be taken to prevent the spread of the disease.

At a Board of Health meeting held August 10, 1864, Dr. Hillebrand states that Mai Pake is spreading and recommends isolation.

Kamehameha III died December 15, 1854. No enactment against leprosy or any discussion on the subject took place during the reign of this king.

Kamehameha IV died November 30, 1863; the only official mention of leprosy during the reign of this king was, as previously stated, by Dr. Hillebrand in a Queen's Hospital report, dated April, 1863.

During the reign of Lot, Kamehameha V, an act to prevent the spread of leprosy was enacted, which is here given in full.

AN ACT TO PREVENT THE SPREAD OF LEPROSY, 1865

Whereas, The disease of leprosy has spread to considerable extent among the people, and the spread thereof has excited well-grounded alarms, and whereas, further, some doubts have been expressed regarding the powers of the Board of Health in the premises, notwithstanding the 302d Section of the Civil Code, and whereas, in the opinion of the Assembly, the 302d Section is properly applicable to the treatment of persons afflicted with leprosy. Yet for greater certainty and for the sure protection of the people:

Be it enacted by the King and the Legislative Assembly of the Hawaiian Islands, in the Legislature of the Kingdom assembled:

Section 1. The Minister of the Interior, as President of the Board of Health, is hereby expressly authorized, with the approval of the said Board, to reserve and set apart any land or portion of land now owned by the Government for a site or sites for an establishment or establishments to secure the isolation and seclusion of such leprous persons as, in the opinion of the Board of Health or its agents, may, by being at large, cause the spread of leprosy.

Section 2. The Minister of the Interior, as President of the Board of Health, and acting with the approval of the said Board may acquire for the purpose stated in the preceding section, by purchase or exchange, any piece or pieces, parcel or parcels of land, which may seem better adapted to the use of lepers than any land owned by the Government.

Section 3. The Board of Health or its agents are authorized and empowered to cause to be confined, in some place or places for that purpose provided, all leprous patients who shall be deemed capable of spreading the disease of leprosy, and it shall be the duty of every police or District Justice, when properly applied to for that purpose by the Board of Health, or its authorized agents, to cause to be arrested and delivered to the Board of Health, or its agents, any person alleged to be a leper within the jurisdiction of such police or District Justice; and it shall be the duty of the

Marshal of the Hawaiian Islands and his deputies, and of police officers, to assist in securing the conveyance of any person so arrested to such place as the Board of Health, or its agents, may direct, in order that such person may be subjected to medical inspection, and thereafter to assist in removing such person to a place of treatment, or isolation, if so required by the agents of the Board of Health.

Section 4. The Board of Health is authorized to make such arrangements for the establishment of a hospital where leprous patients in the incipient stages may be treated in order to attempt a cure, and the said Board and its agents shall have full power to discharge all such patients as it shall deem cured, and to send to a place of isolation contemplated in Sections 1 and 2 of this Act, all such patients as shall be considered incurable, or capable of spreading the disease of leprosy.

Section 5. The Board of Health, or its agents, may require from patients such reasonable amount of labor as may be approved of by the attending physicians, and may further make (I have never known of a single instance where the foregoing regulation re labor to be performed by a leper, was enforced—Author) and publish such rules and regulations as by the said Board may be considered adapted to ameliorate the condition of lepers, which said rules and regulations shall be published and enforced as in the 284th and 285th Sections of the Civil Code provided.

Section 6. The property of all persons committed to the care of the Board of Health for the reasons above stated shall be liable for the expenses attending their confinement, and the Attorney General shall institute suits for the recovery of the same when requested to do so by the President of the Board of Health. (Never enforced—Author.)

Section 7. The Board of Health, while keeping an accurate and detailed account of all sums of money expended by them out of any appropriations which may be made by the Legislature, shall keep the amounts of sums expended for leprosy *distinct* from the general account. And the said Board of Health shall report to the Legislature at each of its regular sessions, the said expenditures in detail, together with such information regarding the disease of leprosy, as well as the public health generally, as it may deem to be of interest to the public.

Approved this 3rd day of January, 1865.

KAMEHAMEHA V.

Section 302 previously referred to is as follows:

When any person shall be infected with the small-pox or other sickness dangerous to the public health, the Board of Health, or its agents, may, for the safety of the inhabitants, remove such sick or infected person to a separate house, and provide him with nurses and other necessities, which shall be at the charge of the person himself, his parents or master, if able; otherwise at the charge of the Government.

Here is legislative enactment relating to leprosy which antedates a law passed in 1909. The framers of this later law evidently overlooked it.

AN ACT TO AMEND SECTION 4 OF CHAPTER 62
OF THE PENAL CODE

Be it enacted by the King and the Legislative Assembly of the Hawaiian Islands in the Legislature of the Kingdom assembled:

Section 1. That Section 4 of Chapter 62 of the Penal Code be and the same is hereby amended so as to read as follows:

Section 4. "The Board of Health is authorized to make arrangements for the establishment of hospitals, on each island, where leprous patients in the incipient stages may be treated in order to attempt a cure; and the said Board and its agents shall have full power to discharge all such patients as it shall deem cured, and to send to a place of isolation contemplated in Sections 1 and 2 of this Act, all such patients as shall be considered incurable or capable of spreading the disease of leprosy."

Section 2. This Act shall become a law from and after the date of its passage, and all laws in conflict with the provisions of this Act are hereby repealed.

Approved this 11th day of August, A. D. 1884.

KALAKAUA REX.

Other laws relating to the care, treatment, and segregation of lepers will be found at the end of this book.

CHAPTER III.

CLIMATE OF HAWAII

From Dr. Alonzo Chapin's description of the Hawaiian climate in the year 1836. (He was a Missionary physician.)

"Situated in the very midst of the vast Pacific, without any extensive inland causes to affect the temperature, and remote from the cold, chilling winds of the temperate and frigid zones, the Sandwich Islands possess a remarkable evenness in the degree of atmospheric temperature; cool breezes by day from the sea, by night from the mountains, serve to mitigate the burning heat produced by a vertical sun, and to render the climate pleasant. The thermometer varies but little from day to day, and even from month to month; and what is particularly to be remarked, all portions of the islands, along the shores, are alike in this respect. Districts most parched by heat and drought do not differ essentially in temperature from those sections where almost daily showers and perpetual trade winds prevail. As we recede, however, from the lowlands along the sea and ascend the mountains, a change is immediately perceived, and along their extended sides we may procure almost any degree of temperature.

The greatest heat marked by the Fahrenheit thermometer at Honolulu was 85°, lowest, 55°.

PHYSICAL FEATURES, TELLURIC AGENCIES, ETC.

The interior of each island is uniformly elevated, and among them are found mountains of the first order of elevation.

Those on Hawaii rise to the height of about 14,000 feet, and have snow on their summits a great part of the year. The whole group are of volcanic origin, numerous extinct craters of different periods and dimensions are scattered over the surface, and two large volcanoes, Maunaloa and Kilauea, are still in action, affording immense currents of liquid lava. The shores of the islands are much diversified and furrowed with frequent ravines, some of great depth, which furnish courses for the impetuous mountain streams. Plains of different dimensions, varying from a few rods to many miles in extent are frequent. More commonly, however, the mountains extend with a gradual slope entirely to the beach, and here and there present bold and black lofty precipices to the dashing of the waves. The sides of the mountains, if we except the loftiest, are verdant entirely to their summits, and pre-

sent immense tracts of exceedingly fertile soil. The leeward shores have generally an arid and even sterile aspect, owing to the infrequency of rain, and cultivation is there promoted mostly by irrigation from the streams, and it is only the tracts immediately contiguous to these which possess much verdure or will admit of cultivation. The condensation of the vapor from the moist ocean-borne trade winds in their passage over the mountains produces continual rains on their summits, which, extending backwards towards the sea, keeps the earth wet much of the time and gives rise to a luxuriant growth of vegetation. Hence the windward sides of all the islands are, unlike their leeward shores, extremely fruitful and productive. The streams originating from springs and rains on the summits of the mountains, pour down their sides with great impetuosity, and after a few meanderings are turned aside from their course to irrigate the lands and replenish the fish ponds, or are discharged directly into the sea; and I know of no body of water emitting sufficient miasma to create sickness along its borders.

I have occasionally met with stagnant ponds which emitted a foul and offensive odor, and could in no way satisfy myself of the reason for the exemption of the inhabitants along their borders from fevers, but by supposing the effluvia to be diluted and rendered inert by the continual currents of winds. (The true reason is because no malaria transmitting mosquitoes infest Hawaii—Author). Small marshes abound, but are fed by springs and the pure mountain streams, and are thus prevented from becoming noxious. They speedily dry up during a few weeks' absence of rain, and the rivers also disappear unless kept alive by frequent showers and the small pools, which remain at such times and which abound after every rainy season, do not become sufficiently putrid to exhale a fever generating miasma. (We have the day mosquito, the species that infects man with yellow fever, but we have NO yellow fever in Hawaii. Dengue is probably spread by the night and day mosquitoes, but it is a very mild disease in Hawaii, and is not endemic.—Author.)

If any one variety of soil has a specific power to produce malaria, it does not exist in Hawaii. The upland soil is formed of decomposed lava, the lowland plains along the sea are constituted of a mixture of alluvium washed from the mountains and decomposed coral. Its immunity from noxious exhalations is the same, whether parched with drought or merely moist, as when the evaporation is most abundant after the rains.



THE TARO PLANT.

The tops are cooked and eaten like spinach. The root furnishes the famous Hawaiian poi.

The staple article of diet is poi made from the taro plant, the *Arum Esculentum*, which is more generally eaten by the Hawaiian people than any other vegetable; it grows like the *Arum Triphyllum* in wet or damp situations only, and when uncooked is exceedingly styptic and acrimonious—these qualities are destroyed by heat. The natives prepare it for use by thorough cooking, pounding it to a pulp, and adding sufficient water to make a thick paste, in which state it is called poi, and thus prepared, it is eaten with one or two fingers, according to its consistency. As an article of diet it is simple and nutritious, and after the fermentative process has commenced it is preferred by the people.

The sweet potato, the pala, a fern root, the tops of pulu fern, the nut of the kukui, the banana, many varieties of seaweed, along with a great variety of fish and crustacea, are eaten raw. The meat of the pig, dog, fowls, beef, mutton, salt salmon constitute the chief articles of Hawaiian diet, most of these are cooked, baked in an underground oven.

The equableness of the climate and the simplicity of the Hawaiians in their regimen and most of their habits of life are, compared with other civilized countries, such, that the variety of their diseases is neither numerous nor complex. Their remoteness from other lands is so great that few contagious diseases are imported amongst them. The diseases most common are fevers, ophthalmia, catarrhs and asthma, rheumatism, diarrhoea, dysentery, cutaneous diseases, tuberculosis, dropsy, venereal diseases, and they occur in frequency and in about the order I have mentioned (this was in the year 1836); diseases sometimes occur epidemically, as was the case with catarrh, repeatedly, and croup once during my residence at the islands. Many other diseases not specified were often met with.

Fevers, though this is the most frequent and numerous class of diseases among the native population, they are by no means the most malignant and fatal. They occur in almost every form, but when idiopathic, are usually remittent. They are, however, most frequently symptomatic of other diseases. The excitable state of the system, which predisposes so strongly to febrile attacks, is not common to these islands, and the universal custom of the people to repose during the hottest part of the day aids in counteracting other unfavorable influences.

The simplicity, too, of their diet and habits of life is not calculated to promote a state of excitability.

Their food is mostly vegetable and fish, with but a scanty

and irregular supply of meat; until of late they made no use of alcohol, and no stimulating condiments so freely employed in civilized countries. Their only drink is water, kokoolau tea, awa they use, prepared in a none too cleanly fashion. Cold, which operates more extensively than any other morbid agent, produces probably more than one-half of all the diseases which exist, and more than three-quarters of all the idiopathic fevers on the islands. The habitations of the natives are considerably scattered, but in a few instances crowded together in such numbers as to exhibit the dense appearance of large towns and villages.

There is, however, throughout, an entire exemption from those pestiferous exhalations which so extensively poison the atmosphere of populous places in hot climates. All animal and vegetable substances thrown away by the people or cast up by the sea are quickly devoured by the number of hungry dogs and swine, so that no detriment is experienced from their putrefaction. The dwellings of the native population are merely slender frames of posts and poles tied with strings and covered only with thatch; they are generally small, often so low as not to admit of standing erect within, and in their best condition serve as an imperfect protection from the wind and rain and the excessive heat of a vertical sun. Every atmospheric change is quickly felt, cold and dampness easily penetrate, and no sooner exist without, than they are felt within. Add to this their leaky condition, the almost naked state of the inhabitants, their common practice of sleeping at night on the bare earth outside of their houses, and their habit of continuing long in the water and exposing their bare bodies to the strong currents of wind, when overcome with heat and perspiration, and it will not be surprising that diseases incident to such causes should abound. Fevers induced thereby are very prevalent."

Robert Crichton Wyllie, Prime Minister of the Hawaiian Kingdom, requested answers from all of the American missionaries in the Hawaiian Islands, in May, 1846, "On the Influence of the Native Houses on Health."

Rev. Titus Coan: "Native houses are usually too small, too low, too dark, not well ventilated, too filthy, and too perishable in their materials and construction."

Rev. J. Green: "The native houses are certainly defective, exceedingly so, most of them are without partitions. Still, nearly all could make improvements in their style of building comfortable dwellings."

Rev. E. W. Clark: "The houses generally are grass huts, many of them miserable; some have permanent partitions, but not the majority. Less improvements have been made in houses and in dress and furniture. Natives accustomed so long to a mere shelter do not feel the inconvenience of their houses."

Rev. R. Armstrong: "The houses are generally too small, without ventilation, floors, windows, or partitions, and extremely unhealthy. Many are very damp from the ground, as well as from the rain."

Rev. B. W. Parker: "The native houses are almost invariably small, poor, and uncleanly."

Rev. A. Bishop: "The houses of the common people are defective in almost everything which constitutes civilization."

Rev. J. S. Emerson: "The native grass houses, when built well, are probably more healthy than any others, if they are not suffered to be damp by having no floor. The convenience of windows would be great, but expensive. Floors would greatly induce to health, partitions would aid much in advancing moral purity, but neither are much sought by the people at present."

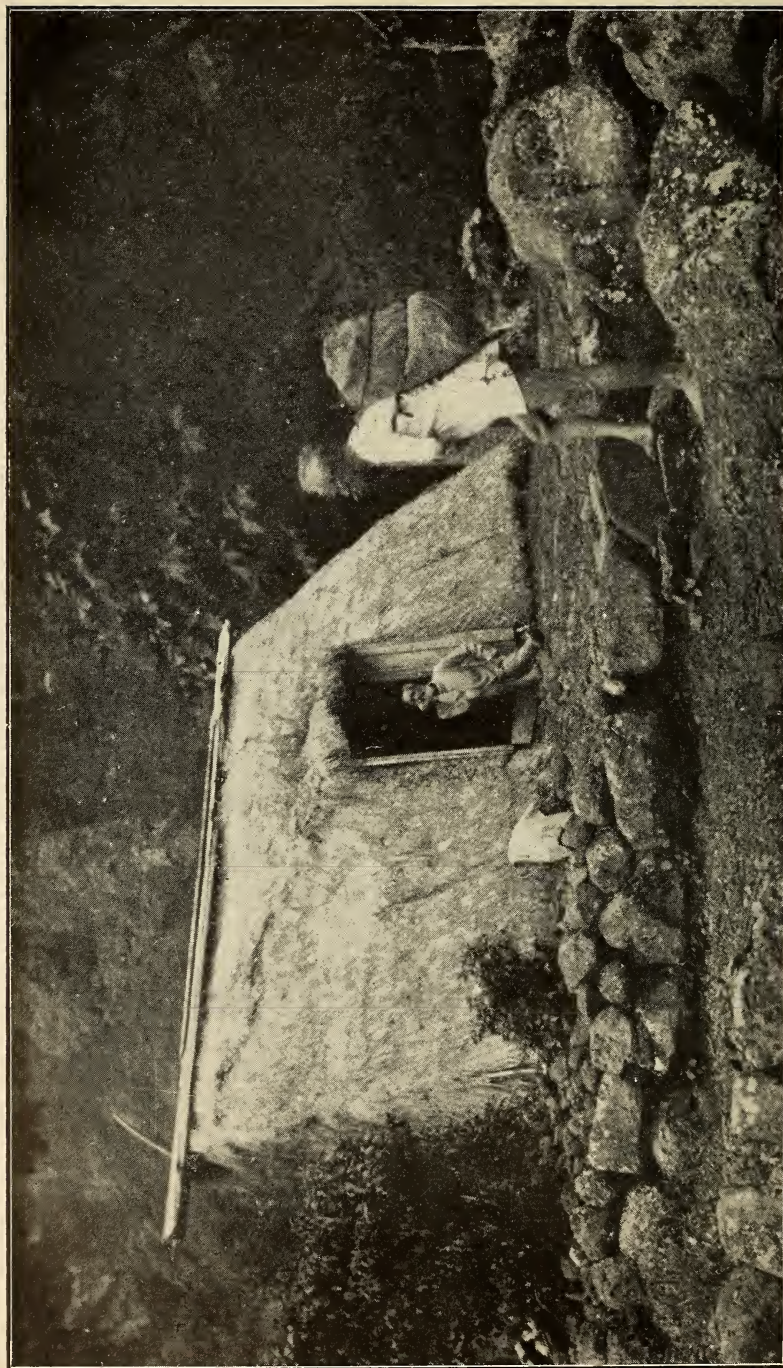
Rev. J. Green: "The method of living in small houses having no partitions, and crowded with men, women and children, is exceedingly unfavorable to the formation and strengthening of the virtuous habits, but exceedingly favorable to the vicious propensities."

CERTAIN AILMENTS UNDERMINING THE HEALTH OF HAWAIIANS

If it be a fact that the aborigines of America were affected with syphilis and gonorrhoea before Europeans visited them, it is certain neither disease existed or was known in Hawaii before the visit of Captain James Cook in January, 1778, and the "Lady Washington," from Boston, July, 1785. At or about this time the foreigner is credited with having introduced into Hawaii the two above diseases, which rapidly spread amongst the native Hawaiians; following the well-known pathological law, "any infective disease finding new fields, is always more virulent than the same disease prevailing amongst older communities."

CUTANEOUS DISEASES, SCROFULA AND EPIDEMICS

Still quoting Dr. Chapin (because the Hawaiian people numbered 108,579 about the time of the Doctor's observations, and he had a larger aboriginal field to survey than we have today).



HAWAIIAN GRASS HOUSE.

Cannot be washed nor disinfected. Many occupants render air impure. Earthen floor, hence damp. Harbors vermin of all kinds.

"Though the Hawaiians are remarkably fond of the water and are fastidiously particular in their practices of washing and bathing, they are, nevertheless, somewhat uncleanly in some respects in many of their habits of life. Beasts and fowls occupy the same habitation, and not unfrequently on the same mats with themselves; their oft-repeated ablutions may be regarded as timely. The kapa, or native cloth, is worn without cleansing, till having become foul with dirt and vermin, and too ragged to serve longer the purpose of covering or protection, it is laid aside. Hence diseases induced or exacerbated by such causes have a fruitful soil, and flourish luxuriantly. The itch is extremely prevalent, and often assumes a virulence unknown in our own country. The pustules, becoming confluent, are converted into large and troublesome ulcers; other scabious diseases exist. Scrofula is not only frequent, but extremely malignant."

Quotations from other missionary workers are here stated, concerning diseases of Hawaiians.

Mr. Coan: "The principal diseases are of the venereal, scrofula, and cutaneous character. The climate is very healthy."

Mr. Green: "No contagious or epidemic diseases prevail at Makawao, occasionally influenza prevails; since I have resided here few diseases prevail."

Mr. Bishop: "No contagious diseases except cutaneous eruptions, which are very prevalent and distressing. Most prevailing and mortal diseases are due to venereal corruption of the blood."

Mr. Emerson: "The itch and venereal diseases are destructively contagious."

In answer to another question of Prime Minister Wyllie's "How far is the health of the Hawaiian affected by the enervating effects of indolence and indifference as to anything beyond the mere wants of animal existence?"

Mr. Coan: "Physical, mental, and moral inbecility, diseases and vice, are extensively engendered and sadly perpetuated by indolence and indifference to anything beyond the mere wants of animal existence."

Mr. Green, greatly affected: "Nothing compared with these as a source of suffering, both moral and physical. Here is the fruitful source of vice, misery, and death. The nation is rusting out."

Mr. Clark: "Indolence here, as everywhere, has a debasing influence on the moral and physical condition of the people. It

is the mother of vice and disease. As artificial wants increase, the character of the people is generally elevated."

Mr. Parker: "Both the moral and physical health of the natives is most seriously affected (injured) by their indifference and improvidence."

Mr. Bishop: "Indolence is attended with enervating effects on the constitution. This is evidenced in females who have nothing to do, and yet they are more subject to sickness than the men. Perhaps there are other causes productive of sickness in many females, the consequences of vicious idleness."

Mr. Emerson: "This people are indolent and many of them are improvident, and sickness and death are often the result of this improvidence. They have no beds for the sick, and no suitable food or diet in such cases. Their houses, mats and sleeping places often generate disease and prevent the effects of suitable remedies, if administered, and often deter from the attempt to administer remedies that would be suitable, if circumstances would allow of their use. But whether this indolence and improvidence are peculiarly inherent in the Sandwich Islands, or the result of a system of oppression long practiced, in connection with the absence of that stimulus produced by artificial and imaginary wants connected with civilization, is yet to be proved."

Mr. Gulick: "Very injurious and to a considerable extent. Yet this indifference appears to be merely the result of the system by which, till recently, they were deprived of nearly all their rights, and thereby precluded from the hope of materially bettering their condition."

Mr. Johnson: "I think the moral and physical health of this people is in some degree injured by indolence and indifference to the wants of both body and soul."

CHAPTER IV.

LEPROSY IN INDIA

The secretary of the government of India states that at the present day, "there appears to be at least three centers of comparatively intense prevalence amongst the teeming millions of people," viz.:

"(a) The Beerbhoom and Bancoora districts in the lower provinces of Bengal;

"(b) The Kumaun district in the northwestern provinces;

"(c) The Deccan and Konkan in the Bombay and Madras presidencies, respectively."

(? From these great and ancient races were derived the Hawaiians.—Author.)

Indian Report, page 80, Messrs. Lewis and Cunningham, assistants to the sanitary commissioner of India, state: "That leprosy has been known in India for 3,000 years, but with regard to our definite knowledge of its actual causation, it is to be feared that we have not, except phraseologically, advanced very much on the etiological views recorded by Atreya, many centuries before the Christian era, which were to the following effect:

"When the seven elements of the body become vitiated through the irritation of the wind, the bile, and the phlegm, they affect the skin, the flesh, and the spittle and the other humours of the body. These seven are the causes respectively of the seven varieties of Kushta (leprosy), the Kudig of the Javanese."

This medical philosopher Atreya lived at least 2,000 years before the Christian era and wrote the 'Charaka Sanpita' on the pathology of the disease, extracts from which are as follows: "The man who neglects the disease at its commencement is sure to die, for it becomes incurable."

He described 4,000 years ago the various kinds of leprosy, the descriptions of which are so clear that they accurately delineate the disease as it is existing today. "The Kushta (leprosy) thus produced causes much pain and suffering—none of these varieties result, however, from the vitiation of a single humour.

Kushtas are of seven, or eleven, or a larger number of a kind, and these, constantly irritating the system, become incurable.

The wind, the bile, and the phlegm, being vitiated, react on the skin. When the wind is most vitiated, it produces the Kadala Kushta.

When the bile is the most vitiated, the Audumbara.

When the phlegm is the most vitiated, the Mandala.

When the wind and the bile are affected, the Rishyajihva occurs. When the three, the bile, the phlegm, and the wind, the Sidhma is produced, and the three together produce the Kanaka."

The causes of the disease Atreya states to be as follows:

1. Excessive physical exercises after exposure to too much heat or too much cold.
2. Taking food after surfeit.
3. Eating of fish with milk.
4. Using barley with several other grains, such as "Hayanaka," "Dalaka," "Karsdusa," along with venison, milk, curdled milk and butter milk.

5. Excessive sexual intercourse.

6. Long protracted excessive fear or labor.

7. Fatigue, interruption of catarrh, vitiate the phlegm, the bile, and the wind; hence the skin and the three others become slackened. Thus irritated the elements corrupt the skin, and other humours and produce Kushta (leprosy).

The premonitory symptoms of Kushta are as follows: "Want or excess of perspiration, roughness, discoloration, itching and insensibility of the skin, pain, horripilation, eruption, and excessive pain in the parts that are about to fall off.

The worms that form in leprous eruptions destroy the flesh, skin, veins, muscles, and bones and when affected by these worms, the patient suffers from spontaneous discharges of blood, insensibility, loss of sensibility of the skin, mortification, thirst, fever, dysentery, burning weakness, disrelish, and indigestion. The Kushta then becomes incurable."

LEPROSY OF THE BIBLE

The Biblical leprosy may have been derived from this same source, "the cradle of the world."

Atreya was the first writer on leprosy, followed several centuries later by Moses, as set forth in the Book of Leviticus, and it is reasonable to assume that the people of Israel carried the disease into Egypt; hence the warning in Deuteronomy, Chapter 28, verse 27: "The Lord will smite thee with the Botch of Egypt, and with the Emerods, and with the Scab, and with the Itch Whereof thou canst not be healed." These must have been

some dreaded and incurable diseases. While the Greek word "Lepra" means scaly, or skin disease, instances where true leprosy was the disease, and that it was contagious in those times is evidenced in the casting out of the lepers, their clothes and homes being destroyed.

That the leprosy of the Bible was evidently regarded as contagious, that skin manifestations were in evidence, and that it was also incurable, may be inferred, and is set forth in the appeal of the ten lepers to "the Master Physician, Christ," for aid. "We are incurable, aid us." "We stand afar off, contagious." And *one*, when he looked at his clean skin (where the disease had been) and saw the changed condition, gave thanks to God; hence his skin must have been one of the main situations of his leprosy.

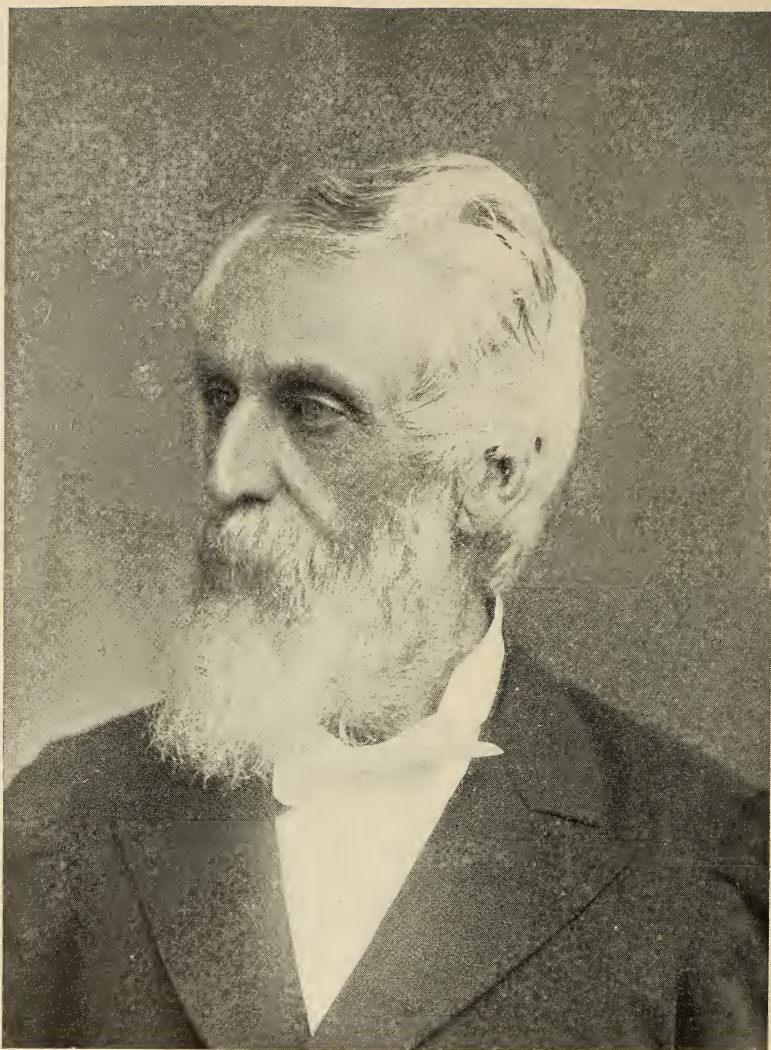
THE LATE PRIME MINISTER W. M. GIBSON'S VIEWS

The late Walter M. Gibson, Prime Minister in King Kalakaua's reign, and also president of the Board of Health, a bright, clever, incisive writer and speaker, brings forward the theory, "That, inasmuch as the Polynesian race (the Hawaiians are a part), had their origin in India and gradually moved away from that cradle of all mankind, where leprosy has been known to exist for 3,500 years, it is within the bounds of probability that they carried the seeds of leprosy with them," and when syphilis was brought to Hawaii by the crews of Captain James Cook's ships, it fanned the latent leper taint into activity, and this accounts for the prevalence of leprosy in Hawaii today.

Mr. Gibson was an able and convincing writer, and elaborates and freshens up his theory with very plausible statements, anyone can read them in full in the Board of Health reports of previous years. But alas! all that fine writing and elaborate argument is lost on the Author (one of the self-assertive doctors, as he is pleased to call any of us who have the courage to express and maintain our own opinions).

The bacilli of leprosy and syphilis, instead of attacking each other, sleep together like firm friends, and 3,500 years of leprosy passing through the bodies of the Hawaiian people should have rendered and given them some immunity. The Gibson theory works the wrong way, and is in conflict with the laws and doctrines of our most able pathologists and bacteriologists.

I present some more of Mr. Gibson's statements: "Leprosy has attacked at times every race in the world, but its chief abid-



WALTER MURRAY GIBSON.

King Kalakaua's Kuhina Nui or Prime Minister, 1882-7. President of Board of Health, managing editor of "Advertiser" and the Hawaiian vernacular newspaper, "Nuhou."

Orator, diplomat, writer, able, shrewd; resisted and easily out-maneuvred the efforts of his opponents to remove him from office. He was OUSTED from office by the Revolution in Honolulu, June 30, 1887. The political battles in the years 1884-86 in the Hawaiian Legislature had some semblance to the British troubles in the time of Charles I, only King Kalakaua and two-thirds of his parliament opposed a one-third minority. Cromwell, Ireton, Bradshaw, Fairfax, and Hampden, had similar representation in the Hawaiian Legislature. Mr. Gibson died in exile in San Francisco, California, January 21, 1888; his body was brought to Honolulu for burial.

ing places have been beds of the fell disease—in Java and other islands of the great archipelago, where the natives present most striking affinities with the Hawaiian race; the diseases that affect them also afflict the Hawaiians.

The Javans treat as outcasts all who are suffering with the Kudig, or leprosy, and the unfortunate ones have voluntarily segregated themselves upon small islands, where they are supplied with means of subsistence by their friends."

CENSURE OF THE DOCTORS

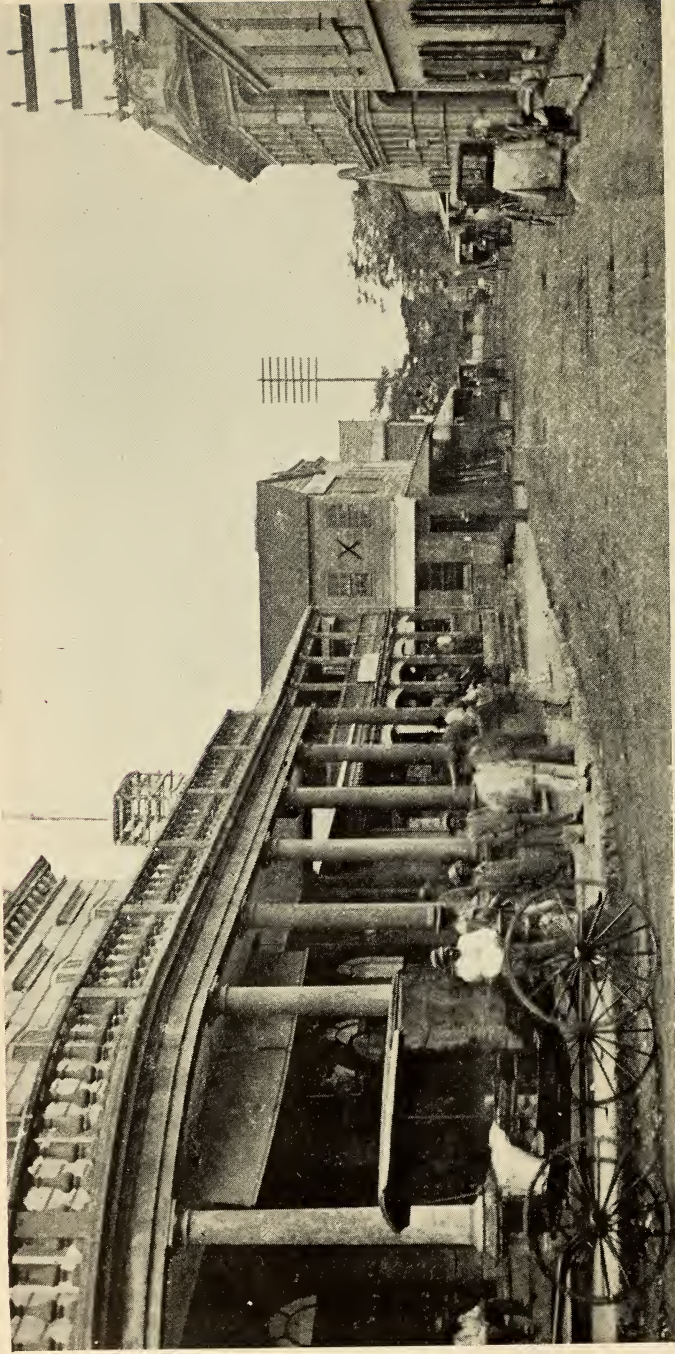
The late Walter M. Gibson, when president of the Board of Health in the year 1886, seemed to express surprise that the medical profession should be so divided on the question of: (First) "Contagiousness of Leprosy;" (Second) "The absence of an unanimity of opinion on the cause of the spread of the disease in Hawaii," and (Third) "Failure to check or cure it."

Mr. Gibson was one of the brainy men of that by-gone age, the days of the monarchy; he was a fluent, able, and interesting speaker. I set forth one of his caustic declamations against the medical profession in Hawaii.

"The sooner medical men get down to some sensible base and conclusions on leprosy, the better it will be for all mankind. The average thinking layman in Hawaii Nei can draw conclusions on the subject of leprosy as good, if not better, than many members of the medical profession. The layman is not wedded to any pet theory, does not try to look wise when he talks on this subject of leprosy. *Is it not a fact that doctors pretend to know a great deal more than they do know?*

Their so-called dogmas, theories, and nescience change with the wind, their views are bewildering, prone alas! at times to be blindly self-assertive, dogmatic, and tyrannical; pledged to individual schools of thought, and sometimes their attitude to each others' theories and arguments assumes the fierce form of dog-eat-dog! This may be overdrawn, but if you reflect, gentlemen, you must admit its truth.

In order to cure the Hawaiian race of its ills it requires the spirit of divine love, not the stern, scientific methods of London, Berlin, Paris, New York or elsewhere."



THE HOME OF "THE PACIFIC COMMERCIAL ADVERTISER", A. D. 1883.

Merchant Street, Honolulu. Owners, Claus Spreckels and Walter M. Gibson.

The building with the colonnade is the Honolulu Post-office. The adjacent building with the steps and upper and lower veranda is the famous "Honolulu Hale."

The framed double-story building, marked with a cross (x), with the door in the angle, was the "Home of the Advertiser," and through this door the poor ordinary mortal entered the Sanctum Sanctorum; after entering through this door the following super-
scription above another door, met the visitor's gaze, "Abandon hope all ye who enter here."

This building was torn down some twenty-six years ago. On April 27, 1885, the "Advertiser" located in a new frame building, on the Waikiki side of the Stangenwald Building on Merchant Street.

EUROPEAN LEPROSY

A world-wide prevailing disease like leprosy would be expected to respect no country. We are told by historians that the Crusaders acquired the disease in Asia Minor and Palestine about the year 1100, A. D., brought it back with them and thereafter it spread all over Europe.

It has been estimated that the continent of Europe in the middle ages had an approximate population of 50,000,000 people, and 10,000 lepers per year would be a low average estimate of the number of cases of that disease.

The greatest period of activity of the disease was between the years 1200 and 1500, A. D., and the number of leper homes and hospitals reached nearly twenty thousand.

By the beginning of the eighteenth century, leprosy had lost its virulence and had become extinct in the greater part of Europe. Today, in certain parts of Norway, Finland, Sweden, Russia, and Spain, leprosy maintains a sluggish existence and isolated foci of infection are still in evidence.

From the earliest records of its greatest prevalence, to its decline, a period of some five hundred years, Europe is credited with having had five million cases of leprosy; approximately one million cases every one hundred years. Apart from its endemic prevalence in the before-mentioned countries, occasional sporadic cases appear in previous extinct centers even in this twentieth century, and certain families, who, in several generations past had been free from the disease, have again been subject to fresh outbreaks.

The tendency of leprosy to cease and then recrudescence is one of its dread peculiarities and applies to both locality and person; the victim of the malady is never safe, hence the broad statement, "once a leper always a leper."

In the early part of the middle century period, the house, hut, or home of the people consisted of a one-room, one-story dwelling, built of uncut stone, laid in a mortar composed of mud, chopped straw or rushes, moss or seaweed; the roof was thatched with straw, reeds or rushes, no windows to admit light or air were provided; no board or stone floor was laid, tamped earth, covered with rushes or long grass, served the purpose. Houses so constructed, in the light of our present day knowledge, were damp, ill-ventilated, and when crowded with human beings and domestic animals, very unhealthy and uncomfortable.

In the cold months of the year, with no provision for ventilating and warming these hovels, their contained air would be in a prime condition to spread any contagious or infectious disease, taken together with the method pursued of distributing the refuse food, etc., under the rush or mat floor, this being the most convenient locality for disposing of the sweepings, rubbish and left-over food.

Diseases like typhus, typhoid, tuberculosis, syphilis, leprosy, and the exanthemata (eruptive fevers) must of necessity had free scope to infect and spread amongst the inmates of these overcrowded and insanitary dwellings.

During the sixteenth and seventeenth centuries changes for the better took place in improved conditions of living, food, and better sanitation. The improvement was slow, even the value of sunlight and fresh air was not appreciated as late as the nineteenth century. A tax on windows, size and number, was in operation for several centuries; it was aimed at the foreign glass trade, but it discouraged good ventilation.

The people, learning from costly experience, that cleanliness lessened illness, gradually all the old-style disease-producing conditions were done away with. Stone, tile, or board floors were laid; lime for mortar, lime-washed walls, spread on brick or stone came into use. Offal, swill, kitchen sweepings and refuse were removed from the dwelling house and disposed of in various ways.

The one-room family residence, used for kitchen, eating-room, and for living and sleeping accommodation, gradually was replaced by partitioned rooms. Beds or benches elevated from the floor came into use, in place of the sleepers lying on the rush-covered, damp earthen floor.

More care was exercised in the selection of fresh food, the semi-cooked and often tainted foods of by-gone days being discarded. Eating with the fingers, probably none too clean, gradually ceased, and knives, forks, spoons, and plates came into general use; and so the disease-spreading habit of passing the food from mouth to mouth passed away.

Surface wells for potable water were dug, a great improvement on the supply from the polluted village stream, or in those days, really sewer, which it was; animals were removed from the too near proximity of the living rooms. Pigs, cattle, sheep, etc., all were slowly provided with suitable accommodations in out-houses.

Now, as to the leper: gradually he was eliminated from the

family circle and removed to a separate room or outhouse, but as the disease still remained active and spreading, the Church came on the scene, and by means of its dreaded fulminations, roused the people to the necessity of ostracising the leper outside the city or village.

It is a significant comparison: (a) the grass house of the primitive Hawaiians, "one room, overcrowded and general insanitary conditions," described by many of the early American missionaries; (b) the one-room house, mud-plastered walls, earthen floor, of the people of Europe, during the ravages of leprosy—these conditions existed even in A. D. 1880, in Norway, an endemic focus of leprosy. Read what Dr. Danielssen states.

"In Norway *most* of the cases of leprosy occur among the very poorest classes of the inhabitants, and especially among those living around the shores of the deep bays, or fjords, on the west coast. The 'huts' of the people generally are of one low, narrow room, in which all the family live, with a small window that is not made to open, and are usually erected in a damp, unhealthy site and surrounded by filth."

OSTRACISM OF LEPERS

Ostracism of lepers, suitable to the conditions prevailing in the middle ages, was put in force in Europe.

The leper was pronounced, by edict of the Church, unclean; with him no eating, sleeping, contact or marriage was allowed—he was pronounced civilly dead—all these conditions were rigidly enforced on all, by Church laws and papal decretal.

The priesthood kept hammering and dinning the doctrine of uncleanness by bell, book and candle-light; leprosy was also denounced as a punishment for some sin committed, and its incurability was by direct Divine command; all these fulminations had their effect—the people listened.

When the unfortunate leper was discovered, he was excommunicated and ostracised; the church bell tolled for his living burial, the unfortunate victim was hereafter dead to the world; the rites and burial services for the dead were performed over him, the ceremony being carried out at midnight; he was provided with food, clothes, and a coffin was one of his gruesome gifts.

These harsh and stern measures in dealing with leprosy bore fruit; ecclesiastical weapons were more effective than physic to check leprosy. What the doctors failed to do, the Church succeeded in doing.

CHAPTER V.

LEPROSY AND SYPHILIS

It has been put forward that when syphilis spread over Europe it influenced the general type of leprosy, modifying it, and giving it certain new features resembling syphilis itself.

This contention is too absurd to need any refutation in the better knowledge we have of both these diseases in modern times. Leprosy is of its own kind. Syphilis is also *sui generis*.

About the year 1863, the alleged similarity of the two diseases brought about inoculation by syphilis to drive out the leprosy; it is needless to say nothing successful came of the experiments, the syphilis did not change the character of leprosy a particle. When the syphilitic remedies were administered the syphilis was checked, and the leprosy remained in statu quo.

In Hawaii, during the year 1882, the leprosy-syphilis connection and the question of the identity of the two diseases came acutely to the front, and the controversy assumed quite a popular topic of discussion amongst the laity and the medical fraternity in Honolulu.

Dr. George L. Fitch was the leading exponent of the unproved doctrine "*that leprosy was the fourth stage of syphilis*," and a scrofula, hence non-contagious and non-communicable except by hereditary transmission. This is no new theory; it had been put forward by other members of the medical profession many years before Dr. Fitch became one of its disciples and re-propagated its tenets with great tenacity and boldness.

The plausibility and novelty of the statements made impressed many of the laity and they sided with Dr. Fitch and championed him and his cause. I doubt if any other member of the medical profession in Hawaii sided with the doctor. He was denounced as a charlatan, quack, and a knave in the press, and this arraignment of the doctor did not suit him; he sued the alleged offending paper for libel and was non-suited. This was in the year 1883.

Dr. Fitch was exceedingly popular with the Hawaiians, the court, King Kalakaua and Queen Kapiolani. He gained the inner confidence of the Hawaiian people more than any other foreign physician that I know of.

I succeeded the doctor and took up his work at the Leper Settlement, and even to the end of my period of service, the lepers were always calling for Kauka Pika's (Hawaiian for Dr. Fitch)

medicines, and to prove that the people were sincere, money was handed me to pay the cost of the medicines.

Certain members of the medical profession in Honolulu assailed the theories of Dr. Fitch in the "Hawaiian Gazette," a Honolulu newspaper, in a signed statement, but they made a serious error in stating leprosy was an "eminently contagious disease," which it certainly is not. This blunder gave Dr. Fitch the opportunity to come back hard at his assailants, because two of the signers of the letter had sent a leper patient from Honolulu to Philadelphia, without any precautions being taken in the transit of said patient, although the Honolulu doctors claimed leprosy to be an eminently contagious disease. I have dwelt at some length on Dr. Fitch and his syphilis-leprosy theory, for it commenced to bring Hawaii before the world as a great leper focus. (See Dr. Fitch's report, Part Four.)

Dr. Fitch was one of the most reckless and careless physicians in his contact with leprosy, he seemed to take delight in putting to proof his non-contagious view of the disease, and was always on the lookout for any case where a possibility of inoculation had failed to produce it.

He brought down the wrath of Dr. Arning on his (Dr. Fitch's) theory of non-contagion, by alleging that at a certain post-mortem on a leper, Dr. Arning had a wound on his finger and failed to wear gloves or take an precaution; the wound afterwards became infected with septic matter from the leper's cadaver. Dr. Fitch claimed Dr. Arning was not sincere, for if he believed leprosy contagious he would have acted differently and taken the precaution to wear gloves whilst making the post-mortems on lepers.

In the month of July, 1886, Dr. Fitch left Hawaii for good, and died at Santa Cruz, California, in June, 1904. Many people in Honolulu believed Dr. Fitch had contracted leprosy, owing to the careless methods he pursued whilst in contact with the disease, and this statement is in circulation today. I know as a positive fact that Dr. Fitch did not show a single sign of leprosy to the day of his death, which was from hepatic disease.

I saw him daily for several weeks in San Francisco in the years 1890 and 1899. The doctor had heard the stories about his being a leper, which were in circulation in Honolulu, and exhibited himself for medical inspection before myself and other physicians in California.

It is as yet an unproven assumption to state that leprosy and syphilis are kindred diseases. Leprosy is definitely known to ante-

date syphilis hundreds of years, records of the disease in China go back 6,000 years. Syphilis is of comparatively recent origin, it became known in Europe and was identified towards the end of the fourteenth century as a new disease. It affected poor and rich alike, the king, the prince, the prelate, the judge—it spared none, and stretched from the artizan's hovel to the steps of the throne.

It held full sway until towards the end of the eighteenth century, when the mercurial treatment, expounded by John Hunter, came into general use and checked the disease.

Dr. G. L. Fitch maintained that if syphilis was still active in its third stage, it then became incurable, passing on to scrofula or leprosy, but as to what was the determining circumstances that brought about this change he gave no satisfactory or rational explanation.

As a matter of fact, certain specific features present in tertiary syphilis are clear and distinct, viz.:

1. Gumma in the liver, lungs, kidneys, spleen, and nerve centers; none of these deposits are found in leprosy.

2. Caries and necrosis of the bones of the skull and long bones of the extremities; changes never found in uncomplicated cases of leprosy.

3. Entire ABSENCE of caries and necrotic changes in the bones of the hands and feet (Carpus, Metacarpus, Tarsus, Metatarsus, and the Phalanges) is the rule in syphilis; whereas in neural and dual, or mixed leprosy, the destructive bony changes of the hands and feet are typically diagnostic of the disease.

4. Paralysis and muscular changes in syphilis are central in origin, whereas the same changes in leprosy are non-central, save and except when the leper is infected with syphilis, in such a case each disease locates and progresses along lines peculiar and specific to itself, but not haphazardly and interchangeably, as the late Dr. Fitch and his co-disciples would have us believe and accept.

Infective leprous neuritis is a purely typical peripheral form of nerve lesion causing paralysis, muscular contraction, and anaesthesia; also the peculiar and selective seats of leprous caries and necrosis of the bones of the hands and feet are vastly different from the osteomyelitis of syphilis and tuberculosis. The resulting changes produced by leprosy, leading to mutilation, destruction, and incurable changes in the affected tissues, can in no manner or form be made to assume a syphilitic role, either by the pathologist or the clinician.

For hundreds of years leprosy, tuberculosis, and syphilis have



ELDERLY HAWAIIAN WOMAN.

Niho Palaoa ornament suspended from neck.

been prominent as a destructive trinity of diseases, assuming complementary relations to each other and progressing *pari passu*; gradually leprosy became supplanted, leaving tuberculosis in almost full possession of the field.

From the time when syphilis became amenable to treatment by mercury, it commenced to lose its severity and wide prevalence; apart from its previous incurability and even inoculability, it took a bad second position to tuberculosis, which is both inoculable, contagious, and widely augmented by fresh foci of infection from animals.

ETHICAL PHASES OF HAWAIIAN LEPROSY

Leprosy in Hawaii from the probable time of its introduction is identical with the leprosy of Europe, both of the middle century period and today, as we see it in Africa, Brazil, Norway, Spain, and the West Indies.

The conditions, social habits, the non-aversion and ignorant contempt displayed by the native Hawaiians for the disease, make it appear to be a much more aggravated type than appears in other countries where leprosy prevails, and both to the lay mind and to many members of the medical profession, leprosy in Hawaii gets a more prominent place as a contagious disease than it really deserves.

Leprologists have expressed themselves as puzzled with certain traits and features of Hawaiian leprosy.

Those leprologists who have never visited our shores, when they do so, and first become aware of the conditions existing here, soon cease to wonder, and can only express surprise that there are not more lepers. This was the feeling with which the great Dr. Robert Koch regarded our Hawaiian leprosy.

After the doctor had spent a week in Hawaii, in the year 1909, and became conversant with the conditions leading to the spread of leprosy, he expressed little surprise and stated: "You cannot stamp it out, you might if the disease was curable."

Dr. Robert Koch, bacteriologist of world-wide fame, and Dr. Walter Brinckerhoff, bacteriologist and late director of the Federal Leprosarium on Molokai (both these gentlemen are now deceased), became aware of the following facts about the Hawaiian race (the chief victims of leprosy), only when they studied the disease in Hawaii at close quarters.

1. Healthy Hawaiians will eat, drink, sleep, and live with a leper voluntarily, and without fear.

2. A healthy Hawaiian man or woman will marry a leper, although there are plenty of well men and women in sight.

3. In order to lead a lazy, free from care existence, many kokuas, or helpers, are willing to become lepers at the Molokai Reservation; try to imitate the signs of leprosy by burning their skins, rubbing in irritating substances, and by other traumatic means, desire to be placed on the list as lepers in order to get their daily food free.

4. In spite of the fact that the main race affected with leprosy are themselves, the Hawaiians view with ignorant contempt the fears of the foreigners, and appear to think that the law of segregation is a special device aimed at them only to cause trouble, injustice, and break up their homes. The Hawaiians mostly view the segregation of their lepers as a tyrannical act, and wholly unnecessary, and cannot for the life of them perceive that the said law is the only means to prevent their possible extermination.

5. It has been said in my presence by Hawaiians of the better class, "Hawaii is our country, it belongs to us, or at least it did until the haole got possession of most of it. If the haole is afraid of leprosy let him go back to where he came from."

All these various facts bearing on the spread of leprosy, the segregation law and the feeling of hostility to its operation, can only be learnt by close contact with the leper situation, right here on the ground, in Hawaii Nei.

WILL LEPROSY BECOME EXTINCT ULTIMATELY IN HAWAII?

This is a question which no man can answer, an opinion thereon must be purely speculative—time alone can decide.

If we could locate the leper bacillus very early in the disease, the problem of extinction would be much simplified. In the five cases I have had opportunity to examine the cadaver of the leper in the very early stages of the disease, I found advanced leprous lesions in the internal tissues of the body; yet there were only a few slight dermal manifestations of the disease—these five cadavers were in cases of Nodular leprosy. In the Neural form—take the case of the ulner nerve—there is generally extensive deposit in its tissues, before the loss of sensation in the little finger, and the wasting of the interossei muscles show themselves. If the physician treating this nerve form of leprosy will reflect on what I have written, it will be more apparent to him why electrical treatment fails to give better results in muscular atrophy and the tonic flex-

ing of the fingers on the palm, in the supposed *early* stages of the disease.

Hawaii has been peopled by emigrants from many countries, and from many of these countries the emigrants often bring latent leprosy, which subsequently develops in Hawaii. Japan, China, Korea, Philippines, India, many islands of the Pacific, the Azores in the Atlantic, Cape de Verde Islands, the West Indies, Brazil, and other South American countries, have all furnished new foci of leprosy for Hawaii.

Emigrants from these various countries have developed leprosy soon after taking up residence in Hawaii, and have frequently claimed that they acquired the disease after entering the country, in order to save being deported to their original homes.

Hawaii claims to be the "Cross-roads of the Pacific," and hence is especially liable to have diseases brought to her shores. Possibly for this reason alone, leprosy may continue to be an endemic disease of the islands for many years to come.

The many insuperable difficulties that bar the way to complete segregation, especially the character of a segregation "that is permanent, and for life," and the almost mono-race prevalence of the leprosy, all react unfavorably and tend to prevent speedy extinction of the disease in Hawaii.

Table of nationality of foreign lepers at Kalihi station, Oahu, and the Molokai Settlement, taken from the Board of Health statistics, 1912.

NATIONALITY	MALE	FEMALE	TOTAL
1. American	5	....	5
2. British Negro	2	....	2
3. Chinese	31	....	31
4. Filipino	3	....	3
5. German	2	3	5
6. Japanese	7	....	7
7. Korean	5	....	5
8. Porto Rican	1	....	1
9. Portuguese	32	11	43
10. Russian	1	....	1
11. South Sea Islander.....	1	....	1
12. Swede	1	....	1
	91	14	105

These figures do not show all the foreign lepers domiciled in Hawaii, many are deported, or return of their own free will to their original homes.

* * *

Does Hawaii furnish any clue that will aid to explain the gradual disappearance of leprosy from Europe?

No clue exists in the leprosy situation in Hawaii up to the present day, that will aid us in arriving at the solution of the cause of the almost total disappearance of the disease in Europe. Our methods of segregation, I have repeatedly stated previously, have been so faulty that no definite reliable statement can be made. The question may be asked, however, "What material effect has segregation had in preventing the spread of leprosy in Hawaii?"

I answer it must have had some effect, but it has not accomplished what the general public and many members of the medical profession expected forty, thirty, and twenty years ago. The various back reports of presidents of the Board of Health are highly optimistic; they sing the same tune, "the end of segregation is in sight, a few more years we will see the last of it." Alas! these predictions have not borne fruit; we still in Hawaii have as yet a continuous source of leprosy from the aboriginal Hawaiians, who are decreasing yearly; it looks on the face of it as if the ratio of lepers is falling off (owing to the decrease of the Hawaiian race) and that alone is the cause of the decrease of leprosy (if there is any decrease) and not segregation.

There are three prominent factors decreasing the disease, viz.: "Increasing Immunity, Non-heredity, and Segregation," they will succeed.

We must turn about and look at what imperfect segregation has done for Norway.

In twenty-four years, by segregation (not rigid by any means). Norway decreased her lepers 45%—from 2,863 lepers to 1,582.

* * *

Leprosy is stated to have become extinct because it was non-contagious in Europe.

Why has leprosy made such a rapid spread in Hawaii, if it is non-contagious?

If segregation causes a diminution in a disease, and not treatment and sanitary measures, it looks to me that when contact with that disease causes it to spread, when the contact is not made possible or lessened (even in faulty segregation), and the

disease diminishes, is it an arrogant assumption to claim it is contagious?

Leprosy, when it invades new fields, makes the same rapid spread, in all the countries, where the leper has been allowed to mingle at large with the people. Hawaii, and more recently South Africa, afford eloquent testimony of the truth of this statement.

Leprosy per se is limitedly contagious, and tends to become extinct. In India it is maintained and nourished by chronic carelessness on the part of some fraction of the population in contact with the disease, from generation to generation. The great majority of the people in India, China, and Japan take precautions and avoid exposing themselves to direct contact with the leper. Caste, religion, non-eating with lepers, etc., all play a part in preventing the spread of leprosy and are just as efficient as faulty and imperfect segregation. Touching, eating, sleeping with a known leper, all these intimate and direct contacts, are sedulously avoided by the Mohammedan races.

CHAPTER VI.

THE RUDIMENTS OF SEGREGATION

The Act to prevent the spread of leprosy by segregation became law January 3, 1865, and shortly after on the 31st day of January, at the first meeting of the Board of Health, the subject of leprosy came up for discussion, and the establishment of a hospital was determined upon.

The members of this Board were: President (ex-officio), the Minister of Interior, Chas. G. Hopkins; members, W. Hillebrand, M. D., F. W. Hutchison, M. D., W. P. Kamakau; secretary, T. C. Heuck.

A site in Palolo Valley was subsequently decided upon as most suitable for a temporary hospital for lepers, and this site was purchased for \$1,000 on March 17, 1865, but was never used, owing to the protests of adjoining residents. On April 3, the Board appropriated \$15,000 for a hospital for lepers.

On June 10, two propositions came up before the Board, the Hon. Godfrey Rhodes sitting as president: (1) a settlement for light cases near Honolulu; (2) for the incurable cases, land on the north side of Molokai, the suitability of the site of the present Leper Settlement being discussed.

A lot at Kalihi, about two miles from Honolulu, on the west side of the harbor and adjacent to the seashore, was chosen as a hospital for light cases and a temporary detention station for severe cases of leprosy. This lot, containing about twelve acres, was subsequently purchased for \$665, and when the accessory hospital buildings were erected this station was known as the Kalihi Hospital and Detention Station. It was opened for the accommodation of patients on November 13, 1865.

Dr. E. Hoffman was appointed physician November 3rd, at a meeting of the Board of Health; the Board also issued the following proclamation addressed to lepers:

"NOTICE BY THE BOARD OF HEALTH

"Whereas, The last Legislative Assembly enacted a law entitled 'An Act to Prevent the Spread of Leprosy,' which said law requires the Board of Health to take such measures as in their judgment shall be deemed expedient to endeavor to cure those persons who are afflicted with the disease, and to protect the public

at large against contagion, at the same time fully empowering the said Board to carry out the purposes set forth in said act;

"Therefore, all persons who are affected with leprosy, or who are suspected to be affected, are hereby notified.

"That the Board of Health has established a hospital with suitable buildings at Kalihikai, on the Island of Oahu, about two miles from the city of Honolulu, where persons afflicted with leprosy will be inspected and medically treated, as well as carefully attended, with a view of effecting a cure. This hospital is carefully arranged by the Board in order to ensure proper attendance and nursing of the patients, and at the same time to endeavor by all possible means to cure the disease with which they are afflicted.

"To this end the Board will secure the best material and medical aid, and will carefully watch over the welfare of such lepers as may be committed to the hospital.

"Time and experience will best prove the proper course to be adopted hereafter, but for the present it is the intention of the Board to require that all cases of leprosy shall be removed to the hospital at Kalihikai for examination. All those who are reported as lepers, but found to suffer from other cutaneous diseases, will receive advice and medicine and be either allowed to return to their homes, or receive medical treatment under the orders of the Board.

"All cases of leprosy of which it is considered practicable to effect a cure will be required to remain at the hospital, in order to be properly treated and attended.

"All such lepers as are in an advanced state of the disease, and liable to endanger the health of others who may come in contact with them by spreading the contagion, will be required to remove to the settlement at Kalaupapa on the island of Molokai, which has been set apart for that purpose by the Board, and where all possible care will be extended to them.

"In accordance with the foregoing rules, the Board of Health hereby notifies all persons who may be affected with leprosy, to hold themselves in readiness to obey the direction of the duly authorized agents of the Board, as to the time and mode of removing to the hospital at Kalihikai. Of this, proper and full notice will be given, and the Board relies upon a prompt compliance with the provisions of the law, and the rules and regulations issued for carrying the same into effect.

"All public officers, when called upon, and the public gen-

erally are requested to assist in carrying out these sanitary measures, so manifestly tending to the benefit of the public.

“T. C. HEUCK, Secretary Board of Health.
“Office Board of Health, October 25, 1865.”

Kalihi hospital continued in operation some ten years, and was abolished in the year 1875 for the following reasons:

1. Great expense of the upkeep.
2. Isolation was found impossible.
3. Failure to effect any cures.

It was also decided that all persons who had leprosy should at once be sent to Molokai, and to this end a suitable building adjoining the police station was erected, where suspects were detained until such time as the medical examiners decided whether they were lepers or not.

ESTABLISHING OF THE MOLOKAI SETTLEMENT.

At the meeting of the Board of Health held on June 10, 1865, a suitable location for a settlement for incurable cases of leprosy came up for discussion, and the suitability of land on the north side of Molokai was to be looked into.

At the meeting of the Board of Health held July 6, 1865, the Hon. Godfrey Rhodes, president, was authorized to inspect the land on the north side of Molokai, Kalawao, and if suitable to procure the same for the purpose of establishing a settlement thereon.

At a meeting of the Board of Health, held September 20, 1865, the president reported that he had visited the island of Molokai, and had purchased the lands of Kalawao and Waileia, some 800 acres for about \$1800 cash with some other government lands given in exchange.

The adjoining westerly land Makanalua was also purchased at this time, and the Ahupuaa of Kalaupapa in the year 1873 came into the hands of the Board of Health.

The first shipment of lepers landed at Kalaupapa, January 6, 1866. This was the beginning of segregation and banishment of lepers to the Leper Settlement on Molokai.

The leper detention station, which was erected adjacent to the police station on King Street, after the closing of the Kalihi leper hospital, was abolished on the opening of a new leper hospital at Kakaako, on December 12, 1881. This new hospital was situated

on the east side of the harbor of Honolulu, on the sea shore about one mile towards Diamond Head. The site was very unsuitable; high tides, especially with south wind, caused the hospital grounds to be inundated by the sea, and after being in existence some eight years, about the year 1889 the hospital buildings were moved back to Kalihi, to a site at or near the old Kalihi hospital which had been closed in the year 1875.

This new Kalihi leper hospital is in existence, and in active operation today, and fills the double office of a detention station and hospital, where mild cases of leprosy are treated, all confirmed and advanced cases being sent to Kalaupapa, Molokai.

LANDS COMPRISING THE LEPER SETTLEMENT.

Kalaupapa—The Leafy Plain or Flat.

Kalauwao—The Leafy Wilderness.

Makanalua—The Given Grave or Pit, because the lake at the bottom of the crater of Kauhako was suitable for, and was used as a burial place for the dead. If the corpse sank it was a good omen, and was proof that the body was acceptable in the Nether Regions; if the corpse floated it was interpreted as a bad omen, indicating that the corpse was not acceptable to the plutonian aristocracy.

Kauhako the crater of Makanalua is located about a mile inland from the nearest ocean contact, and contains a lake of semi-brackish water, its degree of saltness depending on rain-fall and high or low tide; it is potable. The surface of the lake rises and falls with the tide, and has an area of some 5,000 square feet.

At low tide, on the mountain or mauka side of the lake, there occurs a considerable inflow of sweet water from the drainage of the Waihanau (origin or birth of water) basin. This fresh water some three feet in depth is buoyed up and floats on the surface of the underlying body of salt or ocean water, and the color dividing line of these two bodies of water is distinctly visible to the eye from the surface or on diving.

Sounding from a canoe in the month of October, 1886, I found no bottom at 600 fathoms. Mr. and Mrs. Ambrose Hutchison aided me, the latter swimming for two hours in the lake, to prevent the fouling of the line, and the tipping over of the canoe from the heavy drag of the sinker and sounding line.

The greatest elevation of Kauhako is some 493 feet above the sea; the lake in the bottom is 10 feet above sea level.



THE LEPER SETTLEMENT.

Comprised of three sections of land or ahupuaas—Kalaupapa, Makanalua, and Kalawao. The water supply is derived from Waikolu Valley.

Longitude $156^{\circ} 58' W$, cuts the center of this peninsula due north and south, latitude $21^{\circ} 11' N$. cuts it due east and west. Average yearly rainfall, 89 inches. Average winter temperature 70° Fahr. Average summer temperature 76° Fahr.

The land comprising the Leper Settlement is of more recent origin than the main portion of the island; it has been formed by clinker lava, or aa, ejected from the adjacent crater of Kauhako.

One of my desires in sounding the lake of Kauhako was to ascertain the source of the ocean's feed to this lake, by lava tunnel, or seepage, also to learn if it was feasible to shut off by earth, or cement dam, the incoming salt water. If this could be done a considerable body of water, some several million gallons, would be available daily by siphoning, for the supply of the Leper Settlement.

I discovered that Kauhako lake was the extreme apex of a throat or funnel some 30 feet in diameter, gradually widening out to unfathomable space and depth; a condition which put the damper on the possibility of obtaining a supply of water from this source.

CHAPTER VII.

PRACTICAL WORKING OF THE LAW OF SEGREGATION.

The general care and welfare of the leper is better carried out in Hawaii than any other country of the world. This statement is beyond question. The Leper is a chronic hospital patient, a life long one, and the people of Hawaii have nobly met this idea by appropriating sums of money away up in the millions of dollars, which have been expended for the care and support of the leper in segregation.

As long as the country continues in a prosperous condition every nerve and sinew will be strained to combat the disease.

Reader, bear in mind "The condemning of your fellow men, women and children to isolation and involuntary imprisonment for life, to benefit the healthy;" how many realize what this means? Do not be too hypercritical and condemn a system loopholed with faults.

Segregation is the only means left to a community in dealing with a known spreading, incurable disease, even if limitedly contagious.

It is true leprosy is no crime, a ridiculous issue raised by designing and scheming politicians in Hawaii, nevertheless, for the benefit of the healthy, and the general rule, "the greatest good to the greatest number;" the leper is practically condemned to life-long imprisonment of a certain form, not absolute restraint within prison walls, but he is banished to a delightful tract of land on the north or windward side of the island of Molokai, bordering on the ocean, where he can enjoy fine air, sunshine in abundance, and genial surroundings, all the comforts of home, perfect freedom alone lacking, which, even if the majority of lepers wished to avail themselves of, they could not, their disease crippling their bodies and preventing locomotion.

The personnel of the Board of Health for many years has in the main been composed of foreigners. The Territorial Board of Health consists of seven members, three laymen, three physicians, and the attorney-general of the Territory, ex-officio. The members of the Board are appointed by the governor of the Territory. The Board elects its own president, by, and with the consent of the governor; four members present constitute a quorum; all the mem-

bers of the Board are unpaid; the president has a salary appropriated by the Legislature, and may be a layman or physician.

For many years past sixth-sevenths of the members of the Board of Health have been comprised of foreigners—six of these and one Hawaiian; there are many reasons for this, I state a few:

1. The Board of Health and its officials are not too well loved by the Hawaiian people.

2. The appointment as a member of the Board carries no salary.

3. A native Hawaiian member of the Board of Health will certainly not command the votes of the pure Hawaiian race, no matter how popular he is.

For all of the above reasons (and many others I dare not mention in print), the unpopularity of the Board of Health is due, sometimes to true and legitimate causes, sometimes the fault found with the acts of the Board have no justification; it is an inability to comprehend the situation that causes the hostility.

The good intent of the rules, laws, and regulations of the Board of Health are often frustrated by the lack of tact and undue harshness of the executive officers carrying out these rules. This has happened in several instances, where the enforcing of segregation has ended in murder and bloodshed, the absence of violent opposition being in the main due to the GENIAL, KINDLY GOOD-NATURE of the Hawaiian people, who are not easily provoked to anger, and its ally personal violence.

The armed resistance to the leper segregation law that took place on the island of Kauai in the month of July, 1893, in Kalalau Valley, is an instance of gross lack of tact and diplomacy on the part of the Board of Health and its executive; neither can escape the criticism "of doing the right thing at the wrong time." The then Kingdom was silently in a state of civil war, and race hatred at white heat, due to the ousting of Queen Liliuokalani from her throne by the foreign element in Hawaii.

The time was most inopportune for breaking up a leper camp in Kalalau Valley.

The lepers in this camp were fed and cared for by their friends and relatives, and were just as much segregated from the rest of the community as the thirty-nine kamaainas (old residents) at the base of the Kalaupapa Pali, who, for twenty-nine years, were allowed access to and permitted to wander about the Leper Settlement on Molokai. These said kamaainas were finally ejected from their holdings in January, 1895.

When the Leper Settlement first began to be peopled with lepers in January, 1866, many of the kuleanas (or homesteads) of the old residents were not purchased or condemned. The residents on these kuleanas continued to reside on them for twenty-nine years, and during all this time mingled freely with the lepers, aided the well friends of these lepers in their clandestine visits to the Settlement, affording them food and lodging. This, of course, was a loophole in supposed rigid segregation, and is a conspicuous instance showing where efficient segregation was lacking for three decades on Molokai.

SHOOTING OF DEPUTY SHERIFF SIMEON

In the month of September, 1890, I was living in North Kona, Hawaii, when the following occurrence took place.

On the mountain side, about two miles above the village of Kailua, resided a certain Hawaiian male, Kealoha, who had leprosy; his removal was decided on, and Deputy Sheriff Simeon, a native Hawaiian, and two other Hawaiian police officers proceeded to arrest him. The police knew he was armed with two rifles, as he had refused to surrender on demand some weeks before.

The police had no warrant for the man's arrest, went armed, approached the premises of the leper along a narrow path wide enough only to admit one man at a time, and when in close proximity to the house, remained altogether, instead of surrounding the house and taking cover. The police hailed the leper and requested him to come out and surrender. He refused, and the next moment opened fire at a range of seventy-five feet with a smooth-bore, old-fashioned rifle. As a result, Simeon, the sheriff, was shot through the stomach and killed. (The government had to pension his widow for many years.) The leper, Kealoha, again opened fire with a repeating Winchester rifle, the ball ploughed its way along the muscles of the forearm, from elbow to wrist, of one of the policemen, then the officers ran away; subsequently the leper gave himself up.

He told a story of being fired at first by a volley from the revolvers of the police, who denied firing a shot. The truth of the leper's story was evident, he had a bullet wound in the leg from a 38-calibre revolver; the bullet was extracted by the attending physician. The leper died in the jail shortly afterwards.

There have been possibly about a dozen cases of lepers resisting deportation to Molokai by the use of firearms during the

past thirty years, but generally no resistance of a violent character is offered to the segregation law.

Occasionally the courts are used to prevent deportation, and writs of habeas corpus are issued, but these legal proceedings are few and far between, and are just as often stirred up by some designing doctor, lawyer, or other party looking for a fee and notoriety.

THE LEPER WAR ON KAUAI

The most serious and successful armed resistance offered to the enforcement of the leper segregation law took place at Kalalau, a large valley on the northwest shore of the island of Kauai, in the first week of the month of July, 1893.

On Monday afternoon, the 5th day of June, 1893, I was closeted with Edward G. Hitchcock, marshal of the Hawaiian government under the then Provisional Government, in his private office in the police station, Merchant Street, Honolulu.

I am now the only living person who overheard this conversation. The speaker was Marshal Hitchcock, and he was addressing a slim built man about thirty-eight years of age.

"Stolz, you better wait a little until I can spare you some of my foreign police officers, you cannot trust your Hawaiian officers, just as things are at present. You are foolish to think of going alone to Kalalau, because I hear the people and lepers in that valley are practising target shooting. Let this leper business go over for the present, we are not yet out of the woods in Honolulu. This Cleveland and Blount business is a d—n nuisance."

The man addressed had been hurriedly ushered into the marshal's office while I was present, and he was introduced to me as Deputy Sheriff of Kauai, living at Waimea. His name was L. H. Stolz, and his subsequent tragic ending impressed deeply the above conversation on my mind.

A few words about the personality of the late Marshal E. G. Hitchcock will not come amiss. His chief work was as sheriff of the island of Hawaii, which office he held for about nine years, from May, 1888, onwards. He died on Sunday, October 9, 1898, at Waimea, Hawaii, aged sixty-two years; at the time of his death he held the office of circuit judge.

To Sheriff Hitchcock must be given the credit of clearing the island of Hawaii of its lepers, especially the Kona district, where lepers were allowed to remain unmolested for many years. Over 400 lepers and suspects were ferreted out during his term of office,

he never flagged, was tireless and unrelenting in enforcing the leper segregation law. He expressed himself to me as follows: "If leprosy can be stopped by getting all the lepers to Molokai, I propose to keep going after them until I get them all."

Sheriff Hitchcock was thoroughly honest and easily the most efficient all-round officer who ever held the position of Marshal of the Kingdom. He played no favorites, he cringed to none, and asked no favors or advice from anyone, he had good legal knowledge; though hasty and impetuous in speech and manner, he rarely erred, was always resourceful in an emergency, was rarely cornered. His quick and efficient methods of dealing with criminals and law-breakers obtained for him the sobriquet of "The Holy Terror"—it was especially suitable.

THE TRAGEDY OF KALALAU

The advice given to Deputy Sheriff L. H. Stolz by Marshal Hitchcock in the latter's office I have already related. It was also further supplemented by the marshal's stating, "You wait a month or two longer, then I will come up to Kauai and see how the land lays." Stolz answered, "Kalalau is surf-bound at the end of September, and after that the pali is the only way to get into the valley." Hitchcock answered, "No pali phases me, I was born on Molokai, and we have some palis up there. Dr. Mouritz is a great climber, ask him."

On Deputy Sheriff Stolz's return to Kauai he evidently determined to tackle the leper problem in Kalalau alone, as his subsequent action proves.

One evening early in the month of July, Stolz arrived in Kalalau about seven o'clock. He was armed with a 45-70 Winchester magazine rifle, made his business known to the people, and asked for the whereabouts of one Koolau, a young Hawaiian about twenty-four years of age, said to be a leper. This man was a reputed excellent marksman, and he subsequently showed that he well deserved this reputation. Some of the residents of the valley pretended to show Stolz where Koolau was and they accompanied him part of the way; meanwhile Koolau was expecting Stolz, he (Koolau) always carried a rifle, and no doubt was speedily informed of the arrival of the sheriff. I firmly believe the unfortunate sheriff was purposely led into an ambush by his would-be guides.

Koolau suddenly appeared from behind a rock some 200 feet up the trail, which the native guides, with Stolz in advance, were

following. The challenge came from Koolau. "Stolz, you have a gun, are you after me?" Stolz answered: "Yes." Koolau then deliberately rested his rifle on a rock and shot Stolz through the stomach. He fell and straightened up to a sitting position, vainly striving to aim his rifle, waiting for Koolau to show himself from behind the rock which hid him.

In the gathering darkness Koolau called out to the Hawaiians near Stolz: "Is he dead?" They answered "No," then Koolau fired again, the bullet striking Stolz between the stomach and heart, he keeled over dead on the narrow trail he had been following in pursuit of Koolau.

News of the shooting of Stolz was carried over to Waimea the next day, and a steamer brought his body from Kalalau to Honolulu.

This story of the shooting of Deputy Sheriff Stolz came to me from the lips of eye witnesses; some of whom were with Koolau. They were lepers, and I met them at Kalaupapa three months after the shooting.

EFFORTS TO CAPTURE KOOLAU ENDS IN THE SHOOTING OF THREE SOLDIERS

In Honolulu the killing of Sheriff Stolz created quite a stir, and the government immediately took steps to effect the capture of the leper Koolau with a squad of soldiers, who had been enlisted when the provisional government assumed office, after the ousting of Queen Liliuokalani from the throne of Hawaii.

It having been reported that a number of lepers in Kalalau Valley had joined Koolau, were well armed and were also conversant with all the trails and the general features of Kalalau Valley (some nine miles long and densely covered with semi-tropical vegetation, precipitous sides, and in places inaccessible and perpendicular palis). Recognizing all these difficulties, a squad of some twenty-five soldiers and a portable field gun were sent to Kauai.

Koolau was located some miles up the valley. He had no companions except Piilani, his wife, and their little son, who was also a leper. He had plenty of ammunition, several rifles and a supply of food.

The position of Koolau's camp was situated on the side of the valley, some 600 feet above its floor, on a narrow ledge difficult of access, amongst dense vegetation, and at close quarters one determined man could hold off a company.

Koolau was invisible, but he could pick off his pursuers at will when they attempted to scale the ledge on which he was hiding, and no opportunity could be had to return Koolau's fire, except from a position above him, which the soldiers never succeeded in gaining.

One soldier, Anderson, was shot through the lungs by Koolau the second day after the arrival of the squad, and died on the spot where he fell. Another soldier, McCabe, a veteran of the Civil War of 1861-65, was shot through the brain the day after the killing of Anderson, and one other soldier was found shot, with a bullet wound under the chin, the bullet passing upwards through the brain and making exit through the vault of the cranium. Whether Koolau was responsible for the killing of this soldier is doubtful. The field piece, owing to the rough and rugged nature of the country was of no real service.

Due to the losses of these three men, and there being no prospect of capturing Koolau, the squad of soldiers was ordered back to Honolulu. Koolau was never captured or seen again outside of the valley, and died about five years afterwards of leprosy in Kala-lau. His rifle was subsequently recovered and is in Honolulu in the police station's collection of arms.

THE ASSASSINATION OF DR. JARED SMITH

Indirectly due to the successful resistance of Koolau to arrest and deportation to Molokai, came another calamity some four years afterwards in September, 1897. This occurrence also took place on the island of Kauai, at Koloa, and caused the death of Dr. Jared Smith. The island of Kauai had always been remarkably free from crimes of violence until these troubles occurred due to enforcing the segregation law.

One evening about nine o'clock in the month and year before stated, the doctor was called by a loud knocking at his door, when he answered the call he was immediately fired upon by a native Hawaiian. The doctor was shot through the lungs in proximity to the aorta, and his death took place instantaneously.

The alleged cause for the shooting was to prevent the doctor signing an order for deportation of a certain alleged leper girl to Honolulu. The murderer was shortly after apprehended and tried for first degree murder, was convicted by the jury and hung.

Dr. Jared Smith was a child of Hawaii, being the son of one of the early American missionary families; he had the reputation

of being kind-hearted and inoffensive in manner, and was a generous donor to the poor Hawaiians.

The shooting of the doctor was not traceable directly to enforcement of the leper segregation law, he alone had no power to consign any leper to Molokai.

This power of declaring a leper incurable and consigning him or her to Molokai, rests with a committee or commission of five physicians. Further information on this matter can be found on another page of this book, amongst the laws relating to leprosy. The murder of Dr. Smith was the act of a fanatic.

"The smoldering flame of malice aforethought, nursed in the mind of his murderer, due to the successful resistance to the law carried out by the leper outlaw Koolau, in Kalalau Valley, accounts fully for the committal of the deed."

MURDEROUS ASSAULT ON THE POLICE AT KALAUPAPA

Of quite a different nature, and quite unique in the facts leading up to the tragedy, was the murderous assault on the police at Kalaupapa, Molokai, the western village of the Leper Settlement. This happened about 7:30 p. m. on the evening of October 29th, 1885.

It is well known many children, the offspring of lepers born at the Leper Settlement, grow up and show no signs of leprosy, even though both parents are lepers. (So much for the alleged hereditary nature of the disease.) Most of these children, both boys and girls, are often left orphans, and their care devolves on others. Almost invariably the Hawaiian people are fond of children, and the foundling or stranger receives the same care and love as one of the family.

Thirty years ago there were many orphans at the Leper Settlement in the care of Kokua families, but most were cared for by the Catholic mission, under the supervision of Father Damien, at Kalawao, and I claim this was one of the finest works that this priest undertook and carried out.

Father Damien's orphanage was comprised of thirty orphan boys and twelve orphan girls, and more than half these children had a leper father and also a leper mother. Lest I forget to state, fourteen of these orphan girls were removed from the Settlement in the year 1885, to the Kapiolani Home at Kalihi, Honolulu, Oahu, and only one had to be returned some years later as



VIEW OF KALAUAPAPA FROM THE SEA.
Crater of Kauhako (x).

a leper to Molokai. The thirteen others are now over forty years of age, have married, had families, and neither the mothers (these orphan girls from the Leper Settlement) or their children have developed leprosy. (Heredity as a cause of the reproduction of leprosy, takes a back seat in this instance.)

It was determined to remove these orphan children from Molokai, where there was no schooling, absence also of other suitable conditions for growing girls, and ever present the menace, and every possibility and chance of infection with leprosy.

The Kapiolani Home for orphan girls, children of lepers, was to be formally opened and dedicated on November 9, 1885, fourteen orphan girls had to be selected, carefully examined for absence of leprosy, and sent as the first occupants of the Home, their presence being desired at the dedication ceremony.

The officials connected with the Leper Settlement were formally notified of the desires of the Board of Health the third week of October, 1885.

Weeks before this, the intended removal of the orphan girls was the sole topic of conversation. Much speculation was indulged in, sinister motives were imputed to the Board of Health and its officials in the proposed removal.

I may state here, lepers to the number of 800 or more residing at Kalawao and Kalaupapa will have 800 correspondents scattered all over the group, local news from hamlets and villages all over the islands, from Niihau to Hawaii, speedily filters into the Leper Settlement, which also acts as a general clearing-house for news for the entire group.

The officials of the Leper Settlement received orders to transport fourteen orphan girls to the new Kapiolani Home, only sufficient accommodation being provided for this number. In making the selection, considerable and unexpected opposition was met with from three points:

1. The rules of the Board of Health allow no ration for a *kokua*, male or female, but a child born at the Settlement, whether clean or leper, by reason of this birthright, draws rations. None of these orphan girls were over fourteen years of age, and most of them provided the *kokuas* they lived with a Board of Health ration. The girls were made to act as household drudges, doing the washing, ironing, also the work of the whole family; hence if the orphan girl was removed from a *kokua* family, thereafter that family must go hungry, the orphan girl or girls (sometimes several in a family) being the sole support of the family, the foster parents (*kokuas*)

living entirely off the food of the orphan and making no effort to augment it!

2. Sometimes a leper family adopted an orphan child or children into their home, and had their rations increased accordingly, and when the prospect of losing the rations of these children became apparent, strong objection was made.

3. Father Damien had become very much attached to his family of forty-two orphans, twelve of the children being orphan girls, and he strenuously objected to any inroads being made on his orphanage, and suggested that none of the children in his home be removed until all the orphan girls living with kokuas and lepers had been deported.

Naturally all these objections carried little weight with the executive officials of the Settlement; there was a feeling of discontent and some doubt or uncertainty lest trouble might arise, but duty must be performed.

With the aid of Deputy Superintendent A. Hutchison, fourteen girls as near the age of fourteen as possible, were selected wherever they could be found; objections from Father Damien, kokuas, lepers and other interested parties were all brushed aside and ignored.

The placid, even tenor of the Settlement life was raised to one of tension and excitement during the last week of October, 1885.

Although everything was in readiness, the Board of Health, doing the right thing at the wrong time, sent the steamer too late for daylight shipment of the girls. October is a surf month at Kalaupapa, and efforts to induce the captain of the steamer to await morning failed, he claimed his orders were to reach Honolulu at daylight, so the shipping of the girls began about two hours after sunset, in darkness—then the bolt fell, and another leper tragedy happened in the twinkling of an eye.

THE TRAGEDY ON THE CAUSEWAY AT KALAUPAPA

Amongst the little orphan girl deportees of leper parentage was one Abigail, about eleven years of age; she had two foster fathers, Lohiau and Momona, men of middle age and of powerful build, their leprosy not far advanced. These two lepers had made threats against the police several days before the date of the supposed departure of the steamer with the orphan girls; had sharpened, and were seen sharpening, butcher knives. These men openly stated they would resist by force the removal of Abigail.

Several of the girls had said good-bye to their friends, with the usual loud Hawaiian wailing, filling the air. Abigail's little flimsy trunk was being carried by Momona, he was halted by Deputy Sheriff Kanohoahu and police officers Mahiki and Kaumualii. Lepers were not supposed to have contact with the boat's crew (to prevent smuggling of opium or intoxicating liquors), they could come down the causeway leading to the then primitive wharf, but no further.

The police passed Abigail along to the boat, Momona wished to carry the little girl's trunk, but the officers held him up and attempted to take the trunk from his hand. He resisted, and in the struggle the lid of the trunk opened and its contents, the girl's clothes, fell into the sea.

Lohiau, carrying a knife in his hand, unperceived in the darkness, stabbed Kanohoahu twice in the pit of the stomach, and Momona, dropping the trunk, also drew a knife and stabbed Kanohoahu back of the left clavicle, cutting the subclavian artery and piercing the lung. Efforts to wrest the knife from Lohiau ended in his giving a back twist of the weapon, which entered the abdomen of Kaumualii and reached the spleen. Mahiki grappled with Momona, and in the struggle for possession of the knife was stabbed in the right groin, cutting the profunda femoris artery.

Kaumualii died of acute peritonitis in thirty-seven hours; the knives used were rusty, foul and septic.

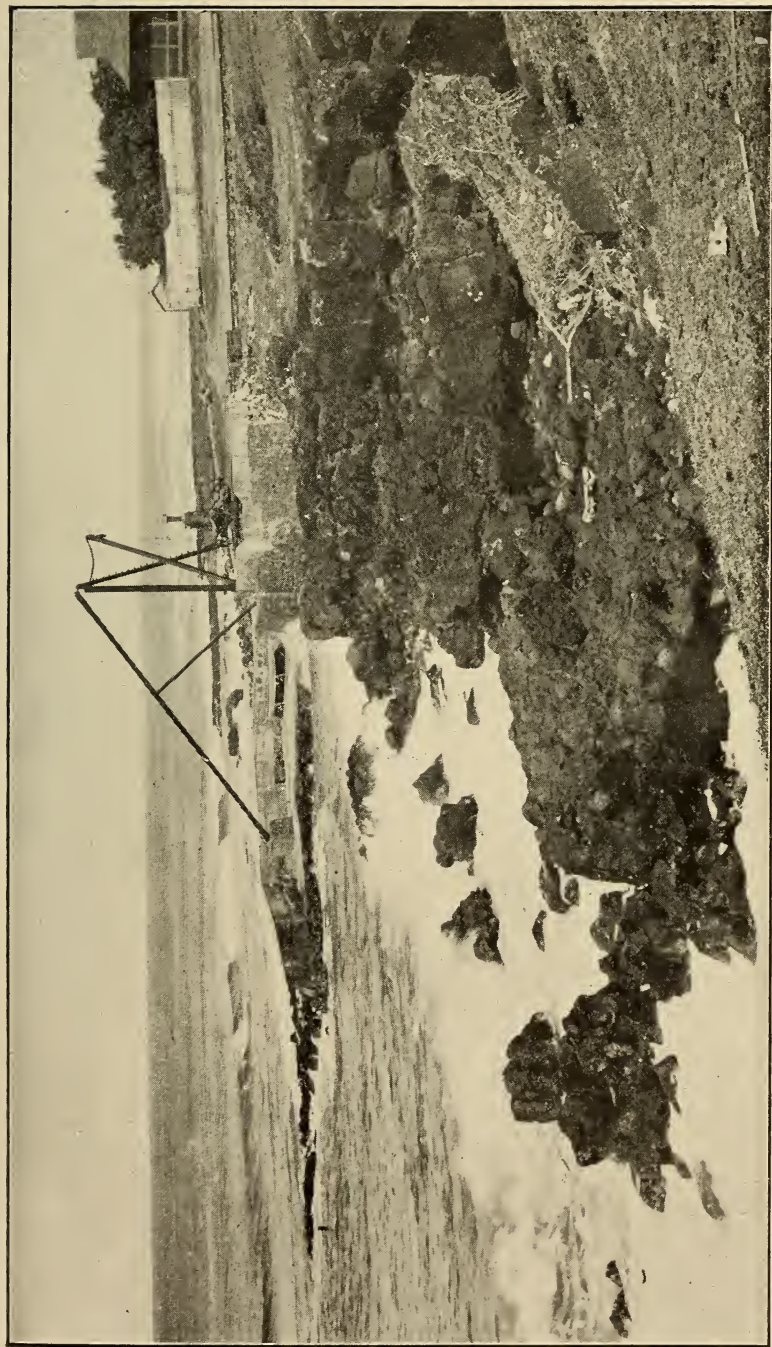
Kanohoahu died in thirty-six hours from acute septic peritonitis and hemorrhage of the stomach, it was alone possible to staunch the subclavian and lung hemorrhage.

Mahiki recovered in six weeks, his wound was 4 and one-half inches deep and cut a large branch of the deep femoral artery.

On the following Monday, November 2, 1885, the tug "Eleu" came to Kalaupapa with the Board of Health and members of the Honolulu police force. Lohiau and Momona were arrested, deported to Lahaina, tried, convicted, and were sentenced to ten years in prison.

To further add to our cup of misery, the officials of the Board of Health and Father Damien received a scolding.

The priest got into hot water, the doctor also, and Deputy Superintendent Hutchison, because we all had wilfully and stupidly disobeyed the clear (?) instructions of the Board of Health. The priest, Hutchison, and myself, heard our denunciations before an assembly of lepers at Kalaupapa from the lips of Mr. Gibson, the then president of the Board of Health.



KALAUAPAPA.

The Landing.

Surf and rocks; treacherous from September to April.

It was also decided to censure R. W. Meyer of Kalae, agent of the Board of Health and superintendent of the Leper Settlement. He was severely crucified in the eyes and ears of the lepers, because he had failed to come down into the Settlement and attend to the shipping of the orphan girls.

A few brief words will complete this unfortunate incident. The prophets for evil predicted grave disaster, pointing to the fact that the Kapiolani Home was baptized in blood, therefore its aims and mission would be brought to naught. This has not been realized, the prophets have long since been gathered to their fathers, the home flourishes and accomplishes well the work it was intended to do.

In former years the general dread and fear that possessed the leper when it was proposed to banish him to Molokai, was in the main due to statements sent out by the segregated lepers, who complained of harsh treatment, no nursing, separation of husband and wife, absence of medical attention, poor and insufficient food, scanty supply of clothes, difficulty of obtaining rations when sick, and a hard, dangerous journey to Waikolu to obtain poi, and many other defects of administration, some real, some imaginary. All the above combination of complaints, if really believed, were sufficient to cause a suspect leper to hide himself, and, if he had nerve enough, to resist segregation by using firearms.

Year by year the public lepraphobia is diminishing, and possibly within ten years a line of policy will be pursued in regard to leper segregation, which if in force today, would be regarded as rash, revolutionary and fraught with disaster.

Lepers affected with the infective neuritic form of leprosy are a very small menace to the community; it is a secondary form of the disease, is more conservative in its attack on the body structures than the nodular or primary form of leprosy, the discharge from the ulcerating surface tissues and from the carious and necrosing bones of the hands and feet is devoid of contagious properties, because the bacillus leprae is almost invariably absent. This same neural type of leprosy could safely have a modified and less rigid form of segregation; the true chief menace and propagator of the disease being the nodular form.

The tendency of leprosy is to become more benign and conservative the longer it exists in a community, its virulence diminishes, the type of the disease gradually assumes the neural form, and the next step brings about its final extinction.

CHAPTER VIII.

EXCERPTS

From reports of presidents of the Board of Health to the Legislature, optimistic and pessimistic, etc.:

1866 A. D.

Ferdinand W. Hutchison, President.

Reports furnished the government by the tax assessors on the different islands on the number of alleged lepers.

Hawaii	75
Maui, Molokai, Lanai	112
Oahu	80
Kauai and Niihau	7
	<hr/>
	274

1868

Ferdinand W. Hutchison, President.

To March 31, 1868.—Number of lepers admitted to Kalihi, 336.

1870

Ferdinand W. Hutchison, President.

"It is believed that there are now FEW lepers not under supervision."

"Dr. Hoffman, physician to Kalihi hospital, reports to me, That no NEW cases, genuine or doubtful, have come to his knowledge during the past SIX months."

"It may therefore be presumed that the measures used to prevent the spread of the disease have produced very good results. There is good reason to believe there will be a final disappearance of the disease if isolation is rigidly enforced for some years.

"It is the opinion of some that the disease is caused by syphilis, others insist that the cause is the use of awa."

1872

Ferdinand W. Hutchison, President.

"Since the last report to the Legislative Assembly (1870), It has been discovered that NUMBERS OF LEPERS were SECRETED, especially on the island of Oahu."

"Reports of medical gentlemen and responsible government

officials gave flattering, but as it proved, deceptive information, that there were few lepers not under supervision.

"From the delusive nature of previous information it would be perhaps not well to indulge in strong hopes as to the future."

1874

Herman A. Widemann, President.

"After inquiries made in the beginning of the year 1873 it was ascertained that at least FOUR hundred confirmed lepers were mixing amongst the healthy population."

"From the beginning of the year 1873 to the present date, April 1, 1874, over five hundred confirmed lepers have been sent to Molokai."

1876

Samuel G. Wilder, President.

"The Legislature of 1874 made an appropriation of \$6,000, the expenses of Drs. Powell and Akana 'for Curing Leprosy.' These parties were offered every facility to try their skill and prove their ability to make good their assertions."

"Dr. Powell left the islands declining to make any trial. The Chinese, Dr. Akana, treated six patients for six months at Kalawao and claimed to have cured ONE, but unfortunately this alleged CURED leper was pronounced a confirmed leper by a number of physicians, and he was returned to Kalawao."

"The Board of Health feels assured that leprosy is under control and that another TWO years of active action will have checked the disease; the Board is confident that the number of lepers at Kalawao will from now on DECREASE."

(Since this optimistic statement was written, 5,536 lepers have been sent to Molokai, up to January 1, 1914.—Author.)

1878

J. Mott-Smith, President.

"The Leper Settlement still remains a national necessity."

1880

Samuel G. Wilder, President.

"The office of president of the Board of Health is one of the most, if not the most, unpleasant that can be held in this government in its dealings with the leprosy question."

1882

W. N. Armstrong, President.

"There are probably 2,000 lepers in the Kingdom, or 5% of the whole native race. It is probable that as many more have the seeds of the disease."

"In the Kakaako hospital there are 400 lepers, and the number is increasing constantly."

1884

Walter M. Gibson, President.

"At least 2% of the entire population are affected with leprosy. At the Leper Settlement and Kakaako there are treated an average yearly of 1,000 lepers."

"During the past biennial period 777 lepers and suspects have been arrested; 90% were cases of several years' duration and should have been PREVIOUSLY segregated."

1886

Walter M. Gibson, President.

"We may at length hope that not only has the dread malady (leprosy) been checked, and to a great extent controlled, but that it is less virulent and malignant in character. I think we are justified in taking a hopeful view of the future."

(Read carefully the following extract taken from pages 46 and 47 of President Gibson's report, and the connection therewith with the leper outlaw Koolau's armed resistance to deportation to Molokai is apparent; this happened seven years later, in July, 1893, in Kalalau Valley, Kauai, which I have already described on previous pages.)

"Hawaiians certainly are beginning to appreciate more and more the fact that it is wise that well developed cases of leprosy should not live with the clean and healthy, but THEY also feel as I do, that the practice of herding all the sick in one place of EXILE is a hardship with DOUBTFUL results.

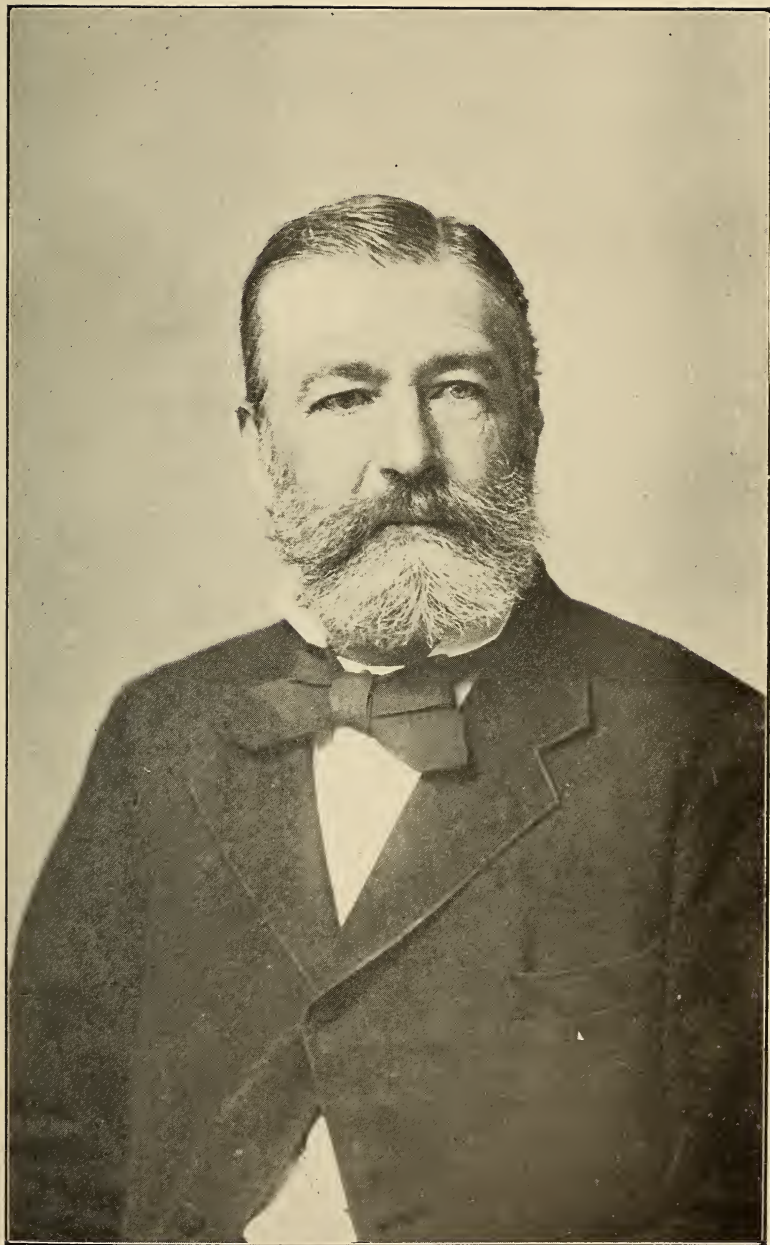
If segregation can be carried out in ways equally beneficial, but more in harmony with the wishes of the people, it should be done.

While it is well for the community that a sufferer from any form of contagious disease should leave his home, it is hardly necessary to compel him to leave his NATIVE ISLAND.

There would seem to be no valid reason why an experiment of 'LOCAL segregation' should not be made on the island of Kauai,

as has been proposed, where a retreat has been selected, and where families having a diseased member might place their suffering relative and attend to his wants, and be nearer to him than if 'doomed' to Molokai.

The government would be willing to provide any reasonable measure of relief as well as to furnish medicines. Where a community is found willing to voluntarily segregate its own sick and to care for them, why should a government be called upon to expend large sums for a plan of segregation which can never be thoroughly carried out, bearing in mind the occult and mysterious nature of the disease in its long term of incubation and development?"



GEORGE TROUSSEAU, M. D., PARIS.

President of the Board of Health; a model executive. One of the few,
a poor man's president. "Suaviter in modo, fortiter in re."

Died May 4, 1894.



PART II.

AGENTS ALLEGED TO CAUSE THE SPREAD OF LEPROSY

VACCINATION.

MOSQUITOES.

FLIES, FLEAS, BED-BUGS.

THE LEPER BREATH.

LEPER BACILLI EXTERNAL TO THE LEPER.

CARRIERS OF LEPROSY.

AWA.

SALT FISH, SALT.

POI.

PEDICULI, SARCOPTES HOMINIS.

* * *

Throughout this monograph the word "NODULAR" leprosy is made use of in place of the word "TUBERCULAR" leprosy, for this latter is misleading to persons unfamiliar with medical terms, and may lead to the assumption that Tubercular leprosy is connected with Tuberculosis.

Neural leprosy, or that form of the disease which affects the nerves, is more appropriate than Anaesthetic leprosy, which is merely one symptom, and present in all forms of leprosy.

Mixed, or Dual leprosy is a form in which certain features of the Nodular and the Neural type are combined.

CHAPTER I.

VACCINATION

There is in Hawaii a widespread feeling of dread and repugnance to the performance of vaccination. The vaccino-phobia had its origin at or about the time of the first small-pox epidemic, May, 1853, when thousands of the Hawaiian race were carried off by this epidemic. In order to check the ravages of the disease arm to arm vaccination became a general practice, in the main due to shortage in the supply of bovine and calf lymph.

Sixty years ago asepticism was unknown and vaccination was performed indiscriminately by any one willing to perform the operation. Each amateur vaccinator acted as he thought best, which meant septic lancets and pus taken from the pustule of the donor, or lymph, if perchance obtained. To the ignorant operator both of these media would serve the purpose, the man, woman or child, whichever it might be, was vaccinated. Penknives were in use when no other lancet or scarifier could be had. It is therefore not surprising that deep ulceration at the seat of operation, erysipelas and pyæmia were common results of vaccination, which speedily brought the operation into ill-repute. What must physicians of today think of the following extract taken from the records of the Board of Health? A respected physician, now resident on the islands, was informed that "the usual price of 25 cents for each successful vaccination was to be reduced to 12½ cents, as some physicians here in Honolulu had vaccinated persons for that sum, and one of them 2,500 for a stipulated sum of \$75, or 3 cents apiece, and provided the vaccine virus!"

Furthermore, in the years 1880-81 small-pox was introduced into Honolulu from San Francisco, and caused the death of 252 persons. Vaccination and re-vaccination was resorted to and many reliable foreigners have told me that as soon as the operation was performed the party vaccinated was thereafter as soon as convenient, subjected to suction of the wound by the parent's mouth, or other person, in order to avoid the germs of leprosy!

When I came to Hawaii in the spring of the year 1883, I soon became aware that even many medical men attributed the unusually rapid spread of leprosy in Hawaii to inoculation by careless and incompetent vaccinators, chiefly laymen. Even one or two doctors, during the small-pox scare, admitted taking the

lymph from arm to arm, without disinfecting the lancet or scarifier before vaccinating each person.

In those early years of my residence in Hawaii I accepted the possibility of vaccination being a very probable and feasible cause of spreading leprosy, but more mature experience has convinced me that vaccination gets more credit than it deserves, and cannot spread the disease, **FOR LEPROSY CANNOT BE INOCULATED BY ORDINARY MEANS ON A DERMAL SURFACE.**

It has also been held by certain physicians that leprosy can be inoculated through vaccination—the vaccine running its regular course in the system and leaving the bacillus leprae “latent” in the scar. I cannot accept this without more proof, for as a matter of fact, the scar of vaccination, plus alleged subsequent development of leprosy, presents not a particle of difference in its appearance from that of the adjacent skin, than does the scar on the arm of a healthy person.

In the year 1887, 62% of the lepers on Molokai showed no scar or mark indicating vaccination.

Where leprosy has invaded certain white and Caucasian-Hawaiian families, and it was believed that vaccination was the attributive cause of the breaking out of the disease, on careful investigation, I found there had been leper contacts with the infected members of these families, as everywhere. The Hawaiians freely admit leper relatives, but amongst foreigners to admit a leper family tree is a rare occurrence. In Hawaii today, if a foreigner develops leprosy it is only too frequently put down to “immoral acts and illicit sexual liasons with some wahine Kanaka.” The injustice displayed by attributing sexual acts as a cause of infecting a healthy person with leprosy is apparent, when it is considered that a large number of persons living in conjugal relation, sometimes the husband a leper, sometimes the wife, fail to contract the disease, and also children of early years, six to ten, frequently are lepers. In the face of the fact that I know of nearly 100 cases where deliberate inoculation with leprosy blood serum has failed to convey leprosy to the inoculated person, it must be a very rare event when vaccination causes the spread of the disease. No one would deliberately use a leper as a source of vaccine lymph. Today all our vaccine lymph is imported, and guaranteed to be pure calf lymph.

Vaccination, no matter how carelessly the operation is performed, would spread leprosy amongst All races alike if it was a cause of spreading the disease. The foreigners are more efficiently vaccinated than the Hawaiians, who, as I have stated before, showed 62% absence of vaccination scars at the Settlement—a very large percentage; yet the foreigners, Caucasians and Asiatics, are very little affected with leprosy. Vaccination is more thoroughly carried out amongst them (foreigners) than amongst the Hawaiians, who ought to be less affected with leprosy, owing to non-vaccination, whereas, in fact they suffer more severely from that disease.

From all the foregoing statements, vaccination cannot be accepted as a factor in spreading leprosy in Hawaii. In Europe the great spread of leprosy occurred 600 years before Edward Jenner (1749-1823) discovered vaccination.

MOSQUITOES

The mosquito was unknown in Hawaii previous to the coming of foreign ships.

In the year 1826 a vessel from Mazatlan, Mexico, at anchor off Lahaina, Maui, is credited with introducing mosquitoes into Hawaii. The fumigation of this ship drove the mosquitoes out of the hold of the vessel, and the story says, "they came ashore in clouds;" today, these islands afford a home to many varieties of mosquitoes, some localities being more affected with "the pest" than others. What species of mosquito was brought in this ship from Mexico is doubtful; from the information I have been able to glean it was possibly the night mosquito, *Culex pipiens*, the break-bone fever carrier. The day mosquito, two varieties, are prevalent in the islands, one, the *Stegomyia Fasciata* or Calopus, which transmits yellow fever to man, is widespread; but we have no yellow fever in Hawaii. That fever is peculiar to the West Indies and its original habitat was there. The opening of the Panama Canal makes the prospect of Hawaii being infected with yellow fever a lurking danger.

Although mosquitoes were brought to Hawaii, as before stated, in the year 1826 (the Hawaiians have no word for mosquito in their language, but borrow the foreign word and use a Hawaiian pronunciation), it was some twenty-five years after their introduction that mosquito nets came into use, sometime in the early fifties.

The late Mrs. U. S. Emerson of Waialua, Oahu, the wife

of one of the missionaries of the American Board of Missions, informed me that it was in the late fifties, 1858 or 1859, that the night mosquitoes first became a pest, and the use of nets had to be resorted to in order to obtain sleep from the annoyance of the insect. I found Waialua more infested with mosquitoes than any other locality on the island of Oahu.

The Hawaiian, if not provided with a mosquito net, covers his head with the blanket to avoid being bitten by the mosquito. This is a most pernicious practice, with closed windows and doors, the air supplied under the blanket is impure, and is rebreathed again and again, is naturally injurious to health and damaging to the air cells, and it is also a predisposing cause of tuberculosis, now quite active and widespread in Hawaii.

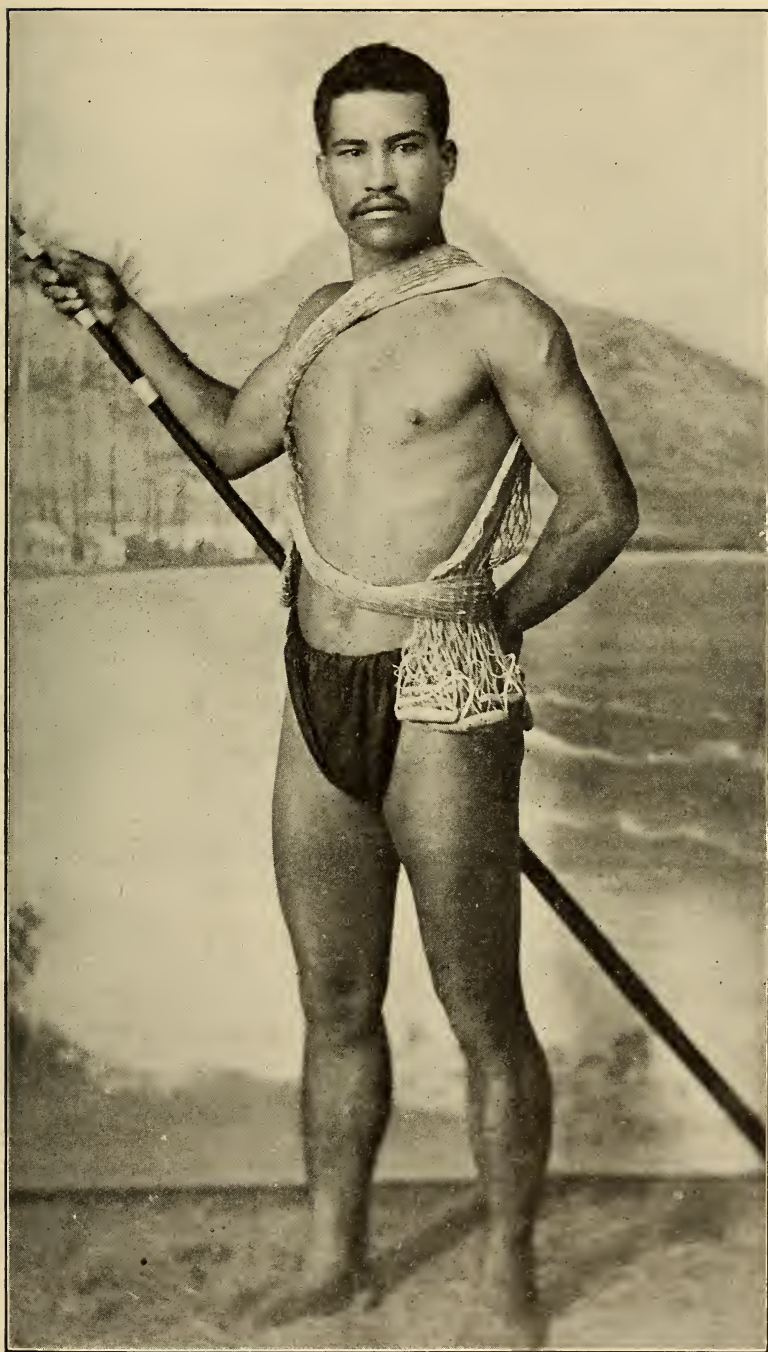
Whether it be mosquito netting, or blanket protecting the sleeper from the mosquito, it is evident that the alleged spreading of leprosy by mosquitoes must affect all races alike, and here comes the stumbling block. Is the Hawaiian more subject to leprosy on account of being more exposed to mosquito bites than the foreign races domiciled in Hawaii?

NO—all races are equally exposed and should develop leprosy *pro ratâ*, if the mosquito spread the disease. I assert that the mosquito may be ignored as an active factor in spreading leprosy in Hawaii, and to back up this assertion I offer the following experimental work.

Mosquitoes of both the day and night species, found inside the mosquito nets of lepers and gorged with blood, were examined with greatest care—the blood in the insect's stomach, its saliva and the whole of the body were carefully triturated in a mortar.

Twenty-eight mosquitoes from different leper beds were examined, twenty of these beds being occupied by confirmed nodular or tubercular lepers. In no single instance was Hansen's leper bacillus observed. In the remaining eight cases of nerve leprosy the mosquitoes collected and examined gave also in all cases negative results—*no bacillus leprae could be found*. A total of sixty-six other mosquitoes were also examined, which infested leper houses, four of the lepers being affected with the Recurrent leprous fever. At such times the bacilli are said to be present in the blood in large numbers, but the mosquito in its contact with the leper's skin and blood had carried away no bacilli in any single instance.

Another point, the mosquito selects by preference the healthy skin of the leper, avoiding tubercles, scars, atrophied dermal patches



HAWAIIAN TYPE.

Pure Hawaiian.

and dense infiltrations; when no other site is available then alone the unhealthy skin is selected.

Mosquitoes do not confine their unwelcome attentions to any one race, as I stated before. If the Hawaiian race were, and if it could be proved they were, more mosquito bitten than any other race, then the mosquitoes' work in inoculating the healthy person, (after sucking the bacillus leprae into its stomach and salivary glands), might be a factor in spreading leprosy, if it, within a reasonable time, found a healthy person to bite. Other experiments with the object of demonstrating and clearing up the part, if any, mosquito inoculation plays in the spread of leprosy, were carried on.

Mosquito cages containing single, two, and four mosquitoes of both the day and night varieties were affixed to the skin of twenty male lepers and ten female. Parts chosen were neck, arm, face, calf and abdomen. The cages were arranged to take in both healthy skin and leper infiltrations, small tubercles with surrounding healthy skin, and anaesthetic patches, the insects being left in contact with the skin from thirty minutes to six hours.

These experiments were carried on at various periods over a term of years. Out of fifty-two previously starved and attenuated mosquitoes, thirty-five insects had fed on the leper, and were torpid and gorged with blood. Seventeen mosquitoes contained no blood. The same peculiar selection of healthy skin by the mosquito became apparent in twenty-two cases, the remaining thirteen insects, possibly because of hunger, sucked blood from the diseased patches of skin.

The most careful search was made for bacilli, but they could not be found. The Haustorium of the mosquito in forty other instances yielded no bacilli, after drawing leper blood.

If the mosquito spreads leprosy, we would have more lepers, and leprosy would not be confined to one race, is my conclusion.

From all this evidence, it is reasonable to assume that the mosquito of any species as a spreader of leprosy may be ignored, even if the bacillus leprae was found in the insect.

FLIES

The same arguments may be used against flies being a cause of the spread of leprosy, that have been used in connection with the alleged spread of leprosy by mosquitoes.

To reiterate again and again, the Hawaiian race is most severely affected with leprosy.

Their houses and surroundings have *no more* flies than the

same conditions prevalent around the houses of Porto Ricans, Filipinos, Negroes, Koreans, Japanese, Chinese, etc., and all other races in Hawaii.

The Hawaiian house has no monopoly of flies. In fact, it has less flies than the houses of the above peoples, who are always cooking and throwing refuse food alongside their dwellings, which attracts the flies. This statement applies to the lower strata of all the above enumerated races.

If the house fly confined its presence chiefly to the Hawaiian house, and the houses of other races were practically free from flies, I might entertain a spread of leprosy by the infection of the food of the non-leper with bacilli from open sores of the body or the sputum of the leper. Of course it is plain that flies, in the presence of a leper with open sores, might be a source of infection to the food of non-leper companions in the same house, or the flies might possibly infect any abraded dermal surface of the exposed parts of the body of the companions of the leper, be they wife, husband, child, friend, as the case may be, but *I will not even admit that a fly can enact this role in the spread of leprosy.*

There is abundant evidence to prove that leprosy is not inoculable by *ordinary* methods (if it is inoculable at all). The bacilli are not per se permanent inhabitants of the blood, excepting in the bacillemia of leprous fever.

Let us turn to syphilis and tuberculosis, both chronic infective diseases, and both well proven to be inoculable. What physician can maintain that the house fly is the sole cause of the spread of syphilis or tuberculosis? Can it be proven positively in any given case that the fly is responsible? As to syphilis, direct inoculation by the fly on the skin (abraded if you like), of a non-syphilitic is such an impossibility that no case has even been recorded, yet we know syphilis is easily inoculable and yet *we do not* claim that the fly spreads syphilis by inoculation.

Leprosy may possibly be spread by flies contaminating or inoculating the skin of healthy persons, although there is *no direct proof that leprosy is inoculable.* What is not claimed for an *inoculable* disease like *syphilis*, we do claim for a *non-inoculable* disease like leprosy. Is not this position unreasonable?

I cannot accept the fly as a material factor in the spread of leprosy; all races are equally exposed to fly contamination. The Hawaiian not specially so. The lepers segregated on Molokai originally came out of the general population of all the races—a leper here, and a leper there. Is it unreasonable to conclude that

the greater the number of people (foreigners) in our population must mean greater fly contact, and hence greater exposure; and the smaller the number of people (Hawaiians) the less the contact and the less exposure to contagion by fly infection?

Bear in mind the figures of 1900 census.

Foreigners, 76% of the total population, with a total of 63 lepers.

Hawaiians, 24% of the total population, with a total of 964 lepers.

More people of any race means more possibilities of fly infection, hence more lepers, and vice versa, less people, less infection by the fly, less leprosy. Whereas the exact opposite condition prevails. The Hawaiian people being in the minority, should be less exposed to fly infection, yet they have a preponderance of leprosy.

If all races were equally affected with leprosy in Hawaii, the possibility of the house fly conveying the disease would receive greater credence.

Leper recruits would come from the ranks of all races if the fly was a specific spreader. Leprosy's remarkable predilection for the Hawaiian people cannot be attributed to the house fly.

In order to throw more light on the claim that the house fly is a source of infecting man with leprosy, then let us go further afield from Hawaii, and look at the aspect of this mooted question in the knowledge we have acquired of the disease in Europe. The continued presence and prevalence of the fly still remains in Europe, and in the summer is just as much an annoyance and nuisance, and a spreader of certain diseases on that continent as it is in the United States of America, but leprosy almost disappeared in Europe, although the house fly still existed and controlled the situation as a spreader, or alleged spreader, of that disease.

No evidence is brought forward to show that measures calculated to diminish or exterminate the fly were ever carried out.

To accept the fly as a possible ever-day menace of the communicability of leprosy, we are led to conclude that coincidentally with the disappearing disease, the infection should have continued in the same ratio of cause and effect as long as the fly existed, but the inference must be drawn, and may be summed up in the statement: leprosy disappears, the cause of its spread (the fly) remains.

The effect is a proved fact, but the cause is not a proved fact. A cause or alleged cause of any disease still existing, and the dis-

ease disappearing, it cannot be truly claimed that the cause or alleged cause of the disease was the true cause.

I have examined hundreds of flies and never once succeeded in finding the leper bacillus, although bacillus tuberculosis was frequently found.

Some more specific cause and peculiar to the Hawaiian race must be sought for, in order to explain the greater prevalence of leprosy amongst that race. The house fly fails to fill the bill. I claim in the face of all the foregoing statements, *the house fly may be excluded as a spreader of leprosy.*

FLEAS AND BED-BUGS

These insects are generally permanent occupants of houses and rooms; they do not travel around like mosquitoes and flies.

If there is to be any infection with leprosy in any given house by fleas or bed-bugs, it presupposes a leper occupant of the house and non-leper companions.

Both these insects are parasites infecting the human race, and derive their nourishment from the blood of the victim who carries them on his or her person, clothes, or bedding.

There cannot be a supposed universal spread of leprosy through these insects, because every house does not contain a leper.

Having examined fleas and bed-bugs from leper houses and failing to find any bacillus leprae, I question if these insects can convey leprosy to a non-leper; they are purely blood suckers, and the blood of the leper is not a permanent habitat for the bacillus leprae.

EXPERIMENTS ON LEPERS

I have fastened both fleas and bed-bugs, in small impromptu cages made out of corn plasters, the cover of a microscopic slide affixed to the opening, and strapped the cage to the inner surface of arms, thighs, and sides of abdomen, both on leprous lesions and healthy skin of lepers; the insects being allowed many hours to feed—from one to four hours. On thorough examination, no leper bacilli were discovered, either in the expressed blood from the insects' digestive tract, or in the insects' body, triturated with alcohol and the solution centrifuged.

Discussing the possibility of a healthy person being infected with leprosy by the bites of fleas and bed-bugs, subsequent to these insects having bitten a leper, I take the same ground as I have done in the alleged fly and mosquito propagation or spread of leprosy.

The Hawaiian race has no monopoly of fleas, nor are its members infested with a preponderance of fleas and bed-bugs in their homes, yet they have excess of lepers; these insects infest all races alike, and each race should show a percentage of leprosy proportionate to its number.

The greater the number of people, the larger the field for the fleas and bed-bugs to spread leprosy. The smaller the number of people, the smaller the field for the fleas and bed-bugs to infect with leprosy.

More fleas and bed-bugs biting the people, more lepers. Less fleas and bed-bugs biting the people, less lepers.

Thanks to the multitude of races in Hawaii, we can tentatively approximate the most probable cause of disease in any one race. Amongst all the previous alleged reasons for the cause of the spread of leprosy I have discussed, viz.: vaccination, mosquitoes, fleas and bed-bugs, under each of these factors common to all races, the Hawaiian race is always paramount as the exponent of leprosy. A more specific and peculiar property attaching to the Hawaiian race must be sought for than insect infection, to which all races undergo similar exposure. The flea by preference seeks the healthy skin to get his blood supply for food. The bed-bug sucks blood from any surface, healthy or diseased, apparently displaying no preference.

Those who are in attendance daily on lepers in homes and hospitals, like doctors, the Brothers and Sisters of Mercy, and other attendants, are fully exposed and are, and must be bitten by fleas (I have had ample personal experience on this point), but after 10, 20, 30 years even, no development of leprosy has taken place amongst these people.

How often can we determine in a given case of syphilis or tuberculosis, the exact means of infection. If we are in doubt would we seek a flea or bed-bug explanation as the means of infection? We would be justified in so doing, knowing that syphilis and tuberculosis are inoculable; but we do not assume that hypothesis. Why not analyze the means of leprosy infection on a broad basis? We have a disease which is prevalent mainly in one race. Why is this? How does this race differ in every respect from the others? I will discuss this later.

From all the foregoing experiments and statements there is every reason to assume that fleas and bed-bugs, as agents in the spread of leprosy, may be ignored.

DOES THE BREATH OF A LEPER CONVEY THE DISEASE?

All the evidence bearing on this question tends to prove that the breath of the leper, even if the contact is close, does not convey leprosy to a healthy person.

The attendants on lepers—nurses, Brothers and Sisters of Mercy; in fact, all those in direct contact with the disease, rarely acquire it. There are no figures to show in an asylum or settlement, that even 1/20 of 1% of the above class of contacts ever acquire the disease from inhalation or even any similar channel.

No more striking testimony can be produced than that afforded by the conjugal relation.

The leper wife, or the leper husband, occasionally conveys the disease to his or her healthy consort, they may live together cohabitating for years and yet the healthy wife or husband may or may not become infected.

What a different disease leprosy is from syphilis in this respect—the aspect of cohabitation—here syphilitic infection of a healthy partner is generally a foregone conclusion.

Syphilis is not conveyed by the breath, and even in *tuberculosis conjugal infection is uncertain*, but the method of infection in these two diseases does give a clue to the way leprosy is conveyed.

If leprosy was conveyed by the leper's breath we would have more prevalence of leprosy amongst all races, not, as here in Hawaii, a one-race disease—Hawaiians.

I append a table bearing on Conjugal infection and Non-infection with leprosy.

STATISTICS DATING FROM YEAR 1880 TO YEAR 1902

Male and female lepers living in the Conjugal relation.

1. Place of collection, segregated on Molokai.....	845		
2. Place of collection, in detention at Kakaako.....	191		
3. Place of collection, various islands of group.....	64		
		Total	1,100
Male lepers	739	Male non-lepers	361
Female lepers	361	Female non-lepers	739
		Total	1,100
Total		1,100	
Total of persons living in conjugal relation.....			2,200

Maximum years of cohabitation	18
Minimum years of cohabitation	8
Average years of cohabitation	13
Husbands who became lepers.....	101
Husbands who did not become lepers.....	260
Wives who became lepers.....	159
Wives who did not become lepers.....	580

Of the husbands, 101, who became lepers,—84 of their wives had Nodular leprosy; and seventeen Neural leprosy.

Of the wives, 159, who became lepers,—136 of their husbands had Nodular leprosy; and twenty-three Neural leprosy.

In an original total of 1,100 clean husbands and wives, 260 (23½%) became infected, and 840 (76½%) remained clean, after an average of thirteen years of cohabitation.

Did these 260 previously clean husbands and wives acquire leprosy by the breath or through sexual intercourse? I answer: by neither of these channels does the specific infective agent, the bacillus leprae, enter the system.

* * *

Digressing a little from the subject of infection from the breath of the leper.

The lepers give birth to many children, most of them succumbing soon after birth—some are born dead, or abortion takes place. I have seen over 200 children, the offspring of lepers, sometimes both parents were lepers. In no single instance were there any signs of leprosy on the children at birth. If we did not know syphilis was inoculable, we quite as likely might assume it was spread by the breath; the presence of syphilis is generally in evidence at the birth of a child of syphilitic parent or parents.

In later years the child of the leper may show the disease, and we might too hastily assume that infection from the leper parent or parents was conveyed to the child at the time of conception. This theory is untenable. The child of the leper is like the child of the tubercular parent—the infection is acquired post natal.

Hereditary predisposition in leprosy is becoming a waning doctrine. It is obsolete. I used to be one of its disciples; more mature experience has convinced me of the fallacy of my position.

In tuberculosis, a well-known contagious disease (through sputum, etc., and being inoculable), the *majority* of those who have



HAWAIIAN TYPE.
Pure Hawaiian Girl.

been exposed to infection through conjugal relation escape the disease.

We may safely conclude that the breath of the leper is similar to the BREATH of the syphilitic, and that it is devoid of infective properties.

THE BIRTH RATE AMONG LEPERS

Sterility in former years was more in evidence amongst the lepers than it is today.

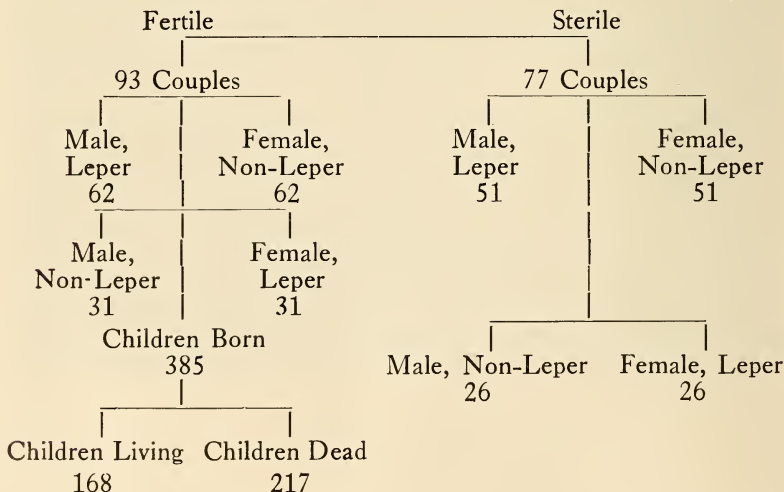
Formerly most of the cases of leprosy when sent to Molokai were of long standing, five to seven years or more, and some over the latter limit. Of necessity the longer duration of the disease sapped the vitality, and the fertility of the leper was impaired or lost entirely.

The segregated leper today arrives at Molokai with a milder and much shorter duration of the disease than formerly, averaging about one to three years standing.

The leper birth rate is very little below that of the non-leper rate, or normal, but premature births and lack of vitality cause most of the children, the offspring of a leper parent or parents, to succumb at or shortly after birth.

It is most remarkable that the children of lepers who reach maturity are free from defects of mind and body. Neither morons nor imbeciles are found, and nanism in any form is absent.

I append an analysis of the birth rate amongst one hundred and seventy leper couples.



EXPERIMENTS ON THE LEPER'S BREATH

In order to satisfy myself if the breath of the leper was a possible means of spreading leprosy, I experimented as follows:

Twelve-inch squares of double folds of antiseptic gauze were suspended over the faces of lepers at distances by actual measurement of 12, 6, 3, and 1 inches from the mouth, for periods of half an hour to three hours, and in two instances in comatose lepers for a 12-hour period; cases were selected free from cough, tranquil ordinary breathing being present.

This experiment was performed on twenty lepers. The gauze, after exposure to the leper's breath was carefully soaked in 5% carbolized water, as little fluid being used as possible; after standing six hours the washings from the gauze were centrifuged, carefully examined and search made for *bacillus leprae*—none were discovered.

On five other lepers—two advanced tubercular cases, one mild case, and two of the neural form of leprosy—a similar set of experiments were carried on with gauze squares on the same lines as in the preceding cases, excepting that the leper was instructed to breathe deeply and cough, but not expel mucus from the mouth, the squares of gauze being held in CONTACT with the mouth and nose for a period of five minutes. The gauze, after contact, was soaked for six hours in a limited quantity of distilled water, the washings centrifuged and carefully examined. Bacilli were found in limited quantity in the two advanced tubercular cases. In the mild case and the two neural, the washings from the gauze failed to show bacilli.

Mosquito nets surrounding the beds of six tubercular (or nodular) cases of leprosy in advanced stages of the disease, the nets not having been laundried for a period of many months, were soaked for six hours in a limited quantity of distilled water, the washings carefully examined for bacilli—all six washings gave negative results.

All this evidence tends to show that if the *bacillus leprae* exists outside the human body, it must be of very rare occurrence, except in the direct presence of the leper. Tables, chairs, and the dust of the rooms in daily use by lepers gave negative results; in no instance were bacilli found, although other observers claim they do exist. The British Indian Commission of 1891 reached the same results that I have done, finding no bacilli on the seats, walks, or in the bathing houses of the lepers. It is a well-established fact that

syphilis is never conveyed by the breath, the specific infective material, syphilis bacillus, must be implanted direct on a mucous, or abraded dermal surface in order to convey the disease.

The foregoing experimental evidence tends to prove that the bacillus leprae, to infect the healthy, must also be implanted on a mucous surface, which surface must possess certain suitable specific properties.

It is very probable that the leprous bacilli in contact with the air after passing through the nose and mouth are cadaveric bacilli, and as such, are incapable of spreading leprosy.

The evidence afforded from the prevalence of leprosy in Hawaii amongst the foreign races, also tends to negative the possibility of leprosy being spread by the breath of the leper.

Out of an estimated foreign population of 160,000 in the year 1912 there were only 105 known lepers, which may be accepted as a fairly correct estimate.

So much contagious and infectious disease is communicated by the breath, it is fair to assume that if leprosy was so communicated, it must affect all races equally. Pulmonary tuberculosis (a dry sputum and a breath-infection spread disease under certain special conditions), in this present year, 1915, selects no special race, but finds in Hawaii its victims amongst all races. It attacks the Japanese, Portuguese, and the Hawaiians, also other races, and it is a worse scourge than leprosy.

It may also reasonably be deduced that if pulmonary infection through inhalation of the leper's breath, was one of the causes leading to the infection of those in contact with leprosy, it would not be confined to one race in Hawaii (the Hawaiians), but each race would show a more equal infection ratio; also the disease would be much more prevalent.

I assume the same ground as in other alleged causes of leprosy previously discussed. More people to inhale the breath of lepers means more leprosy; hence the more numerous the people of any one race, the greater should be the number of lepers, and vice versa, less people, less leprosy.

* * *

LEPROUS TUBERCULOSIS

Leprosy first infects its victim and is often followed by tuberculosis; but how often does a tuberculosis victim acquire leprosy? I know of few such cases.

Both leprosy and tuberculosis will thrive in the same lung,

but the dry sputum from the leper's lung shows no virulent infective power like the dry sputum of the tubercular subject.

Lepers react strongly to injections of tuberculin, just as severe as if their disease was tuberculosis; this reaction is due to deposits (tubercular) in the organs, glands, and other tissues of the leper.

The complication of leprosy with tuberculosis is very frequent; these cases may fairly be termed ones of leprous-tuberculosis, leprosy being the primary disease.

At certain intervals the typical symptoms of leprosy prevail and progress, then come remissions, the leprous symptoms remain in abeyance, later T. B. comes to the fore as the aggressor and destroys the leper.

The destruction of the epiglottis, the stenosis of the larynx, the visceral deposits, intestinal and stomach derangements in the leper are just as frequently caused by T. B. as leprosy.

The physician may cause certain symptoms of leprosy to improve by suitable treatment, but when the disease is complicated by the presence of T. B., the futility of expecting any beneficial result from any treatment soon becomes apparent.

The presence or non-presence of tuberculosis in the leper will generally account for the rapid or slow progress of the disease.

LEPER BACILLI EXTERNAL TO THE LEPER

Do leprous bacilli exist outside the person of a leper? I answer in the affirmative, *in the leper toilets, in the leper's grave, and in the various articles of food and drink which he touches and handles.*

The intestines of the leper, when his disease is advanced, contain the bacillus leprae in large numbers, hence the dejecta act as a vehicle of expulsion.

In leprous diarrhoea and dysentery, due to destruction and ulceration of the mucous membrane of the ileum and large intestine, the shreds of exfoliated mucosae contain the bacilli which are expelled with the movements of the bowels.

Faeces and mucus collected from the seat of the leper's toilet contain abundance of leper bacilli.

The leper ulcer of the bowels is closely allied to and resembles the tubercular ulcer. The solitary and Peyer's glands are in the main implicated, hence the ulcers are observed in the ileum; frequently the caecum and colon are involved, the morbid changes being confined to these localities.

The ulcers are irregular in shape, situated transversely to the mesentery. The spread of the ulcer, following the course of the vessels, involving at times the whole circumference of the bowel.

In size the ulcers vary from one-half to one inch or more, with thickened edges, at times markedly indurated. The floor of the ulcer often shows signs of recent hemorrhages, at times new cicatrization processes are in progress. (See Plate 73, Ulcers of the Ileum.)

I have examined the graves of three lepers. All the corpses had been buried over two years—exact dates unknown—the soft parts of the bodies had all been dissipated.

The liquid and a semi-pulpy material in the coffins yielded plenty of bacilli; but are the bacilli alive? I claim they are not. From the evidence afforded that leprosy is not pathogenic to animals, there is further corroboration.

These bacilli are within every reasonable doubt cadaveric. It is scarcely within the bounds of probability that any person could become infected with leprosy from either the toilet or the grave of a leper, under any circumstances.

In the month of May of the year 1885, Dr. Edward Arning, pathologist and bacteriologist for the Board of Health, and special leprosy investigator, visited the Leper Settlement in the course of his studies. The doctor being desirous of examining a recently buried leper corpse, I showed him the grave of Akana, a Chinese leper, buried about six months, on a hillside, the surroundings and soil being good for drainage. To avoid wounding the feelings of the Hawaiian people, who have an aversion to desecration of the graves of their friends, like ourselves, *even for the advancement of science*, the corpse of the Chinaman was chosen for exhumation.

However, a mistake was made and when the coffin was opened and the corpse came into view, no queue was visible, it was not the body of Akana, the Chinese, but that of Keliikipi, a Hawaiian about twenty-eight years of age, affected with nodular leprosy. This man poisoned himself with opium (cause unknown), his corpse had only been interred three months, but it suited Dr. Arning and he later obtained abundance of bacilli from the decomposing tissues of this corpse.

Examinations of buried lepers' corpses clearly demonstrate that the bacilli resist the products of dissolution and putrefaction. Are they alive? I have stated before, I doubt if these bacilli could infect a healthy person, as they are most probably cadaveric. Dr. Arning was in doubt on this same question, but unfortunately be-

fore completing his investigations on this point, he resigned his position as leprosy investigator for the Board of Health and returned to Germany.

Other investigators came after Dr. Arning, holding official positions with the Board of Health, but sooner or later the relations between the doctors and the Board became strained, and one after the other have left office on account of various troubles.

Dr. Arning pursued his investigations from November, 1883, to December, 1885. After him came Dr. Lutz, in the year 1889; he worked about two years as leprologist for the Board of Health, then went to San Paulo, Brazil.

About the year 1896, Dr. Alvarez was appointed to office as pathologist to the Board of Health, and held office some three years, till 1899. In the year 1909, Dr. Wayson, a resident of the islands for about fourteen years, took charge of the Kalihi Receiving Station and held office until April, 1914, when some unpleasantness with the Board of Health caused him to resign his office.

The many drawbacks, hindrances, and petty tyrannies displayed towards leprologists, have not tended to advance the esteem or enthusiasm of the outer world physicians towards the scientific study of leprosy in Hawaii.

ARE THERE CARRIERS OF LEPROSY?

On this point I put forward certain facts I have discovered in my thirty-three years of professional practice in Hawaii, and in reply to the above I answer that there are carriers of leprosy. They are very exceptional, however, and their presence at large in the population I claim is no factor in spreading leprosy.

First, there are cases of leprosy that manifest in the skin and nerves all the signs of leprosy, and the bacillus leprae may or may not be present. Without any treatment or special change in the conditions of their living, eating, or occupation, the disease disappears for months and years, sometimes becomes active again, making no further progress than it did at the first onset. These cases puzzle the doctors, but not the laity, who affirm, "these people never had leprosy, the doctors have failed to make a correct diagnosis, the disease must have been blood poisoning, syphilis, eczema, or something else; those stupid doctors ought to be sued for damages!"

I especially call to mind five cases which first came to my no-

tice over twenty years ago. These cases showed pronounced signs of leprosy, and had been declared leprosy by competent physicians.

The official examining board being then composed of three medical men, the agreement in diagnosis was unanimous—"Confirmed Lepers."

Four of the five cases were ordered deported to Molokai. There came some hitch and these lepers (?) never left Honolulu. Three of the cases are alive today, their leprosy is not progressive, and the friends of the people loudly affirm that they never had the leprosy. I saw every one of these five lepers, or alleged lepers, and treated two of them, and these said two cases claim that if they *did have* the leprosy I cured them—a very vague and dubious compliment. I regard these cases as permanent carriers of leprosy. The disease has apparently aborted, but it would be impossible to say in the present state of our knowledge, whether they can communicate the disease or not.

They were found free from leper bacilli when a subsequent bacteriological examination was made, but is the freedom permanent? I claim not. Examinations in leprosy should extend over months and years, so peculiar are the freaks of leprosy even in this twentieth century. This is one form of *Carrier or Dubious Carrier of Leprosy*.

Second, amongst 124 females—Hawaiians, Caucasians and Chinese-Hawaiians, healthy in every respect excepting bladder, vaginal, uterine and ovarian diseases, whom I have examined in my gynecological work during the past sixteen years, the vaginal secretion in *seven* of these women contained the bacillus leprae, derived from specimens of mucous secretion taken just within the introitus vaginae. Specimens of the vaginal mucous taken far inside the vagina and from the cervical canal showed no bacilli; which in all of the specimens did not count thirty bacilli on the slide.

* * *

These seven cases had all clean husbands, but had daily contact with female lepers. Under vaginal douches of sublimate solution, used to alleviate the various diseased conditions from which they were suffering, there was complete disappearance of the bacillus leprae, and on later examinations none could be found.

Any inference to be drawn from the cases must be purely speculative.

What I do know from years of experience is this: The semi-

nal fluid frequently contains no leper bacilli, and neither does the menstrual fluid nor the vaginal secretions in the female leper.

The presence of bacilli in the vagina I claim is an "*accidental contamination*," they have no permanent habitat in that canal in the leprous female; cleanliness and douching with plain warm water will clear the vagina. The bacilli enter the vagina from the anus in uncleanly females, and the best proof is that cleanliness keeps the vaginal passage free.

I have notes of examinations of forty-two leprous females in whom the vaginal secretion was carefully searched for bacilli, and only found in four cases. As stated in the above cases, cleanliness, with the use of soap and water ablutions of the anus, and plain warm water douches in the vagina, eliminated the bacilli, and repeated examinations thereafter failed to reveal their presence.

In Hawaii, as in other countries where leprosy prevails, there is present abundance of evidence to prove that the disease is not conveyed by sexual intercourse; this condition being apparent to both the laity and physicians.

The fact that leprosy prevails amongst children of tender age, even as early as three years, should be also borne in mind, in considering this conclusion.

I am convinced that the communication of leprosy by a leper to his or her healthy consort by sexual intercourse, as a means of spreading the disease, may be ignored. Hawaii bristles with evidence to support this claim.

STERILE LEPER BACILLUS

Carriers of leprosy can be found amongst the cases of neural or anaesthetic leprosy, which have apparently aborted or become sterile, such a condition may be temporary or permanent. Take the case where the chief visible evidence of the disease is the implication of the nerves of the elbow and forearm, the median and ulnar, causing the claw hand and loss of surface feeling of the skin of the forearm, hand, and fingers; the typical hollow between the forefinger and thumb; the adductor pollicis, and the first dorsal interosseus muscles being those especially attacked, which the ulnar nerve supplies.

The leprous infection never makes any further progress, but leaves the hand permanently deformed and damaged, so that neurectasis, massage, or electrical treatment are of no benefit.

This trophoneurosis of the hand is solely due to peripheral and non-central lesions, and is generally caused by infective neuritis.



HAWAIIAN TYPE.

THE USE OF AWA A POSSIBLE CAUSE OF SPREADING
LEPROSY

The chewing of awa root, if the chewer is a leper, and the mixture that results, viz., awa juice, leprous saliva and water, is drunk by a healthy or non-immune person; it is certainly a most likely method of causing a limited spread of leprosy, because awa drinking is falling into disuse from year to year. Even when the use of awa was very much more in vogue than it is today, it was never a universal practice amongst the Hawaiians. Awa, kava are names given to an intoxicating liquid made in Hawaii from the root of the piper methysticum. It is in use in the Samoan Islands also.

The intoxication produced by alcohol differs from that of awa; the rapid pulse, mental excitement, loquacity, etc., are all absent. The awa drinker resembles a person under the influence of a narcotic. Awa intoxication makes the drinker silent, stupid, drowsy, with incoherent dreams; speech is affected, causing stuttering, the muscular power is much weakened, there is lack of co-ordination, and in the chronic drinker, temporary motor paralysis occurs. Awa acts more on the spinal cord than the brain. The chronic awa drinker becomes a most repulsive object, his conjunctivæ are deeply suffused, injected, and thickened. Conjunctivitis with purulent discharge is a prominent feature, ectropion or eversion, ptosis, and thickening of the edges of the lower lid are also concomitant symptoms; the skin becomes dry and harsh, and covered with scales which frequently cover the whole body and face.

Apathy, uncleanliness and a general slovenly appearance fills in the picture, somewhat resembling the chronic alcoholic drunkard. Very advanced cases, to a certain extent, resemble leprosy, and it is sometimes mistaken for this disease.

An alcoholic solution of awa root injected into the skin causes anaesthesia, followed by paralysis of the peripheral nerves for several hours.

Internally awa is used for gonorrhoea, vaginitis, leucorrhoea, cystitis, and for kidney troubles by the Hawaiians. It somewhat resembles cubebs in its action.

Foreigners use awa for gonorrhoea and cystitis. It is sometimes prescribed by physicians in Hawaii for these diseases; also it is used in alcoholic solution, or unguent in pityriasis versicolor, in psoriatic affections in leprosy, and in Lichen ruber planus.

The method of preparing awa in Hawaii is as follows: A

portion of the root is washed in water, peeled, and a sufficiently large enough piece to fill the mouth is introduced therein and chewed vigorously, the resultant solution of awa juice and saliva being ejected from time to time into a bowl or calabash. When all the juice is extracted from the chewed piece of the root a new piece is substituted. Sometimes a little water is taken into the mouth to aid the process. Perhaps two to three pints of saliva and awa juice may be obtained by the chewer. To all this, water is added to thin down the liquid and increase its bulk. This solution of awa may be drunk fresh, but more often is put aside to ferment, which process begins in about twelve hours and is aided by the ptyalin of the saliva.

The preparation and drinking of awa spittle is not pleasing to the eye or stomach, and where the chewer is a leper, a syphilitic, or a tubercular subject, which is not rare, the prospect of conveying any of these diseases to a healthy person is quite probable, and is much enhanced if abrasions or sores are present in the mouth of the chewer; he certainly is a dangerous person to prepare awa. Unfortunately, the Hawaiians cannot comprehend the risks of infection that lie in a diseased awa chewer.

The Hawaiians are the only race in Hawaii who use awa; if the chewer is healthy, disease is not likely to be conveyed by its use.

Awa made by a *clean, healthy person contains no bacillus leprae*, but if made by a leper, the bacillus is rarely absent.

Awa drinking in Hawaii nei is generally confined to the adult portion of the Hawaiian race, and is not often used by the young members.

I claim that "here is an agent or factor in use," and peculiar to one race, that will account for a certain number of cases of leprosy; also that this disease can be conveyed to some healthy persons by drinking awa containing the bacillus leprae; if its use is frequent, then infection of the healthy victim is frequent and continuous until his or her leprosy becomes developed and visible.

I now conclude: "The bacillus leprae, in order to infect a healthy person, must enter the digestive tract through the mouth, from thence a general systemic infection occurs through the mucosae of this tract."

Furthermore, most of the cases of leprosy can be accounted for by this method of infection. The human mouth is par excellence a situation for bacteria to develop, flourish, and obtain a temporary nidus, preliminary to passing into the stomach and intestines.

To sum upon this awa question:

Drinking awa uncontaminated by a leper can be no cause for spreading leprosy, remote, or even predisposing; its main effect in chronic drinkers is, as I just wrote, to produce an artificial psoriatic change in the epidermis and outermost layer of the dermis, conjunctivitis, thickening of the eyelids, and ectropion or eversion of the lower eyelids.

On the other hand, contaminated or infected awa, a compound consisting of leper saliva or spittle extract of awa root and added water (just as often used by the chewer to wash his mouth, and from thence he ejects this washing into the awa mixture in the bowl), can most assuredly infect a healthy drinker. In this infected awa, there is every reason to conclude and believe that the bacillus leprae is alive; because the saliva affords one of the best media for developing bacteria, is free from pus and other morbid products (which tend to produce cadaveric bacilli); the even mouth temperature, and the bacilli also protected from atmospheric changes by their own cell wall and the viscid saliva.

The bacillus leprae, introduced into the digestive tract under all the above conditions, is in one of the most advantageous positions to carry infection.

There are other agencies that I claim are more prominent and effective in causing the spread of leprosy than infected awa (I will discuss these later); all of which, in their use and consumption are peculiar to the Hawaiian race—the race chiefly affected with leprosy.

Out of apparent evil often comes good, it is the dark cloud with the silver lining. In no other country of the world but Hawaii are the conditions, bearing on the means by which leprosy is spread, so favorable for its elucidation. It is practically a mono-race selective disease in Hawaii, a peculiar feature, and if we study all the causes leading up to this, we must reach, little by little (even if we blunder on to it) the truth and the answer to the questions:

1. Why is leprosy so prevalent amongst the Hawaiian race?
2. Why are the foreign races so little affected by the disease?
3. By what means does leprosy infect a person?

SALT FISH AN ALLEGED CAUSE OF LEPROSY

Has salt fish, well cured or imperfectly cured, any inherent property that endows it with specific power to cause leprosy? A

theory promulgated by some authorities, who maintain "that a frequent salt fish diet is a chief cause of the spread of leprosy."

This doctrine is not tenable, and cannot be brought into the field to illustrate the cause of leprosy in Hawaii, excepting in two special phases—a chemical and a mechanical—and both of these agencies are merely factors capable of conveying leprosy, but not producing it.

Salt fish, when not infected by the saliva-coated fingers of the leper, can convey no leprosy, but if the salt fish is contaminated by the leper's fingers, it contains leprous bacilli, and certainly can infect a healthy person partaking of this leper-handled fish, provided he is not immune.

A leper eating fish out of the same dish as his healthy companion, pursues a method of eating wherein lies every possibility of infection of this companion.

The leper's fingers convey pieces of fish to his mouth, which fingers carry saliva on the return from his mouth to the fish, and the process goes on all through the meal and at each meal—fingers from mouth to fish, and from fish to mouth, and so on, with constant repetition of the process.

The mechanical aid that salt fish gives as an agent or factor in conveying the disease, consists in the more prolonged fingering required to detach the tenacious bone adhering to fish, in morsels suitable for the size of the mouth, especially when, as is usually the case in Hawaii, the dry fish is eaten uncooked. The fingers of both hands have to be used for a long period in breaking up the dry fish to a suitable size for entering the mouth. At every portion of fish carried to his mouth the leper coats his fingers and finger nails with saliva, and, hence bacilli.

The leper bacilli exist in large numbers in the mouth of the leper at the beginning of the meal, but whether the fish in the dish is continuously infected by the fingers of the leper, is difficult to determine and the results obtained vary a great deal. Each and every contact of the leper's fingers with the fish is a risk to the person or persons eating with him. The fish present in the dish is fingered by the healthy eater, or eaters, who each takes a morsel of infected fish, then comes the leper's turn, then the healthy eater, and so on, until the appetite is satisfied; all the fish being eaten at that meal, or the uneaten fish remaining in the dish being put aside for the next meal. In the interval, the contaminated fish may be placed before some guest visitor, or an absent member of the family at meal time. This guest or visitor may

be a foreigner (a white man). Of course, the leper in the family does not appear to eat, or appear at all, but this visiting foreigner is fed with fish and poi, and if there are the remnants of fish left over from the last meal at which there was a leper eater, this foreigner or guest may or may not be unwittingly infected with leprosy, from the leper-infected remnants of poi and fish set over from this said meal. In the house of his friends, said foreigner may eat time and time again in the same house and under the same circumstances, and then marvel where he contracted leprosy. (Here lies one illustration of the alleged mysterious spread of leprosy.)

I have conversed with and questioned many foreign lepers in Hawaii, and put the question to some of them: "Did you have contact with lepers?" They all make generally the same answer: "I never saw a leper until I came here" (Leper Settlement), and next almost invariably is added, "I never have had anything to do with native women"—hinting at and thinking that I am a believer in the almost universally held idea in Hawaii that leprosy is spread by sexual intercourse. Continuing the questions, "Did you live, sleep, or eat in the houses of Hawaiians?" The answer comes, "I have lived and slept and I have eaten poi and fish when I was visiting or traveling around, but there was no leper present that I saw or heard of!"

Often I have gotten the direct evidence I wanted—the foreign leper stating, as the case may be, "So and So is a leper here (Leper Settlement). I used to know him well; he never came to our house, but I went to his on a friendly visit and ate poi and fish with him, but he then had no leprosy." Just as often as not, other members of the family in the house where this leper foreigner had eaten, were lepers before his host and entertainer became one.

Following patiently every clue, the spread of leprosy can generally be traced, each case of leprosy to another case. It is no mysterious disease as alleged, the path of infection shows a trail, sometimes clear, sometimes hidden.

Investigating the unknown and hidden features of any subject, it is more prudent to seek simple causes and effects and examine them carefully, before proceeding to study the more complex ones.

Applying this reasoning to the solution of the cause of the spread of leprosy, we at first are struck at the marked selection of that disease for the Hawaiian race.

Here we have an absolute fact, prominently outlined before our eyes.

Next we may safely conclude that whatever race is the most affected with leprosy, here will be found abundance of material to work upon, and it will not repay us to spend our time in the narrow field afforded by "sporadic cases," so-called, prevailing amongst foreign races in Hawaii.

ANY FOOD that is handled by a leper is a possible source from which other cases of leprosy may originate, the infection being carried by the fingers and finger nails.

The specific infective principle is the leper bacillus, carried in the saliva-coated fingers. If the leper has ulcerated fingers, I assume there is no added risk, because an ulcerating pus secreting surface, carrying bacilli in contact with the air, are in all probability cadaveric. The limitedly contagious character of leprosy to those in contact daily for years, adds weight to my assumption.

The more finger contact any article of food receives from a leper, the greater the probability of more intense infection of that food with bacillus leprae. Salt fish, owing to its tenacity and bone-adhering properties, is pre-eminently an article of food, where the mechanical factor comes into play (illustrating that salt fish plays the role as an agent or factor of conveyance only, for the bacillus). Salt fish generates no bacillus leprae de novo, and no bacilli are found in the fish until the leper infects it.

Salt fish does contain even when properly cured, Förster's bacillus, motile circular or irregularly circular bacilli, but this bacillus is non-pathogenic, and resembles in no manner of way the bacillus leprae.

EXPERIMENTS WITH FISH

Portions of salt salmon, mullet, akule and aku, all fish in common use daily amongst the inhabitants of Hawaii, were carefully washed, triturated in a mortar, and the washings carefully examined and found free from the bacillus leprae.

Portions of these same fish, uncooked, were given to lepers to chew and churn up in the mouth, the chewing continued for two minutes actual time. The contents of the mouth being then ejected into a sterilized cup and the contents carefully examined.

During twenty-five years, at various times and places, I carried on these experiments on sixty-five leper male and female adults, all cases being mild or moderate ones—no advanced cases were taken. Out of these sixty-five cases, fifty-three of the slides

showed numerous leper bacilli, and in remaining twelve cases no bacilli were discoverable. But this need not be taken as absolute negative evidence, it holds good simply for the examination at that date.

In the face of all this evidence, it is reasonable to assume THAT THE USE OF CLEAN SALT FISH, PER SE, IS NOT A SPECIFIC CAUSE OF LEPROSY, BUT WHEN INFECTED OR CONTAMINATED BY THE LEPER IT ACTS ONLY AS AN AGENT, FACTOR, OR MEDIUM OF CONVEYANCE OF THE BACILLUS TO THE HEALTHY.

To sum up:

THE CLAIM THAT EATING SALT FISH IS A CAUSE OF LEPROSY, OR A CAUSE OF THE SPREAD OF LEPROSY, CAN ONLY BE MAINTAINED BY ASSUMING THAT PREVIOUS INFECTION OR CONTAMINATION OF THE FISH BY LEPROUS CONTACT MUST HAVE TAKEN PLACE.

SALT FISH A CHEMICAL FACTOR IN LEPROSY

Salt fish, by reason of its contained salt and daily use, tends to alkalinize the saliva and diminish the acidity of the gastric juice in the stomach; by both of these chemical changes in the composition of these secretions, the bacillus leprae is more likely to flourish and live in the digestive tract.

The excessive use of salt as an article of diet with any food also tends to bring about the same result. The Hawaiians do eat largely of salt—the poi, their staple food, a starchy paste, is insipid and tasteless without salt.

The salt in use in the Hawaiian home is not the refined powdery salt like that in use on a foreign dining table, but is composed of large, coarse crystals, which crunch under the teeth like our rock salt. This Hawaiian salt is much more saline, biting, and savoury than refined salt; bitter also, from excess chloride of magnesia. As an alkalizing agent, it is far more effective than ordinary table salt.

By actual investigation and test, I found that an average Hawaiian eater consumes from one and one-half to three tablespoonfuls of this coarse salt at each meal.

This excessive use of salt is a serious drawback to digestion; skin troubles, stomach disorders, and kidney irritation, prevalent

amongst the Hawaiian race, can all be traced to the excessive use of salt.

The mouth is a favorite seat for the development of many bacteria—alkaline saliva, high, steady temperature, decaying and fermenting particles of food adhering to and lodging between the teeth, caries of the dentine—all furnish a suitable nidus. Six known bacilli, peculiar to the mouth, find a permanent home in unclean mouths.

Several micrococci, Friedlander's pneumonia bacillus, Frankel's pneumococcus, diphtheria bacillus, tubercule bacillus, syphilis, and leper bacilli, all find a lodgment and home in the mouth.

The saliva is generally alkaline, but not in every person, and by using litmus paper, four different states are revealed—faintly acid saliva, neutral, alkaline, and strong alkaline. The excessive use of salt produces the two latter conditions, which favors the development of bacilli of typhoid, cholera, leprosy, and many others.

The stomach in its normal condition is not suitable for the development of bacteria, but many germs can withstand and survive the action of the gastric juice.

When the acids of the stomach are weakened, or even neutralized, which happens at intervals, bacteria are placed in a more favorable medium for their growth; in like manner, the excessive use of salt by the Hawaiian race can produce this very condition of the stomach which will aid the bacillus leprae.

It is from this view, "eating salt fish in excessive quantity," that brings out the chemical agency, or factor, or quality that aids the spread of leprosy. The salt in salt fish, by its alkaline property, changes the gastric juice, and also the saliva in composition, the acidity of the former being much diminished and alkalinity of the saliva made strongly alkaline.

The salt in the fish, if the fish has been infected by leprous contact, merely acts as an agent, factor, or medium of assistance, by its alkaline property on the secretions of the mouth and stomach, and only to this extent does it aid and favor the development of the leper bacillus in the digestive tract. *The excessive use of salt in the diet or its absence is no specific cause of leprosy.*

By experiment and test.

Refined Granular Table Salt

60 grains added to a 1-to-500 solution of H. Cl.=Faintly Alkaline.

80 grains added to a 1-to-500 solution of H. Cl.=Neutral.

100 grains added to a 1-to-500 solution of H. Cl.=Alkaline.

Coarse Crystallized Hawaiian Salt

30 grains added to a 1-to-500 solution of H. Cl.=Faintly Alkaline.

50 grains added to a 1-to-500 solution of H. Cl.=Neutral.

65 grains added to a 1-to-500 solution of H. Cl.=Alkaline.

80 grains added to a 1-to-500 solution of H. Cl.=Strongly Alkaline.

If the standard of alkalinity of the saliva is to be gauged by litmus paper, then it will be necessary to modify the statement that the saliva is an alkaline fluid at all times.

The saliva from time to time varies in its reaction to litmus paper, being acid, faintly acid, neutral, alkaline, and strongly alkaline.

The saliva in man is a clear, viscid fluid, secreted by the salivary glands. It contains ptyalin, its chief active constituent, a digestive ferment; the saliva lubricates the mouth and softens and moistens the food, thereby aiding mastication and deglutition.

The ptyalin converts starch into maltose (malt sugar).

The saliva is secreted by the submaxillary, parotid, and sublingual glands; lingual saliva is secreted by the glands of the tongue.

Parotid saliva contains no mucin (a protein). It is thinner and less sticky than the other varieties.

Sublingual saliva, from the sublingual gland, is the most viscid of the salivas, its reservoir or pocket under the tongue is a favorite location for the bacillus leprae.

CHAPTER II.

DEDUCTIONS.

1. Having weighed and considered the extreme complex features surrounding leprosy in its multiple and varied aspects, I assume and maintain *that leprosy is a primary mouth infective bacilligenic disease.*

2. I also assert and maintain *that man is infected by leprosy through the mouth, and its connecting passage, the alimentary canal, or digestive tract.* Also that the bacillus leprae first finds lodgment and nourishment in this canal, and thereafter reaches its various selective tissues of the body by penetrating the mucosae of this same alimentary canal, digestive tract or path, (hence my selection for the name of this monograph).

"THE PATH OF THE DESTROYER."

3. The mouth with its contained saliva in the confirmed leper is the main source of contagion to the healthy.

Man is infected through the mouth in seven-tenths of the cases of tubercular or nodular leprosy.

I have not yet reached a conclusion on the many different features of the nerve form of leprosy, but in so far as I have gone, "*mouth infection*" will also explain the manner of infection in this form of the disease.

If we could check, stop, or shut off pulmonary infection in tuberculosis, we would shut off nine-tenths of the cases of that disease, because primary pulmonary infection will account for nearly all the cases: Local T. B., bone T. B., Glandular and Intestinal T. B. alone remaining. Similarly if we could shut off mouth infection in leprosy seven-tenths of that disease would be shut off, and we might possibly eradicate it.

POI VS. LEPROSY

Clean poi, fresh or sour, contains no bacillus leprae, but poi infected or contaminated by leprous saliva-coated fingers and finger nails contains the bacilli, and is a menace to a *healthy* or *non-immune* eater. I claim it is ONE of the chief agents that has caused, and causes, the spread of leprosy amongst the Hawaiian race.

Of all the people domiciled in Hawaii, the Hawaiians alone are the main eaters of poi; this peculiarity of food is almost entirely confined to them, and also with monotonous repetition I add, they are the race for which leprosy apparently has a remarkable predilection.

Poi is a sticky, bluish gray paste, made from the root of the taro plant, *arum esculentum*. It grows in shallow ponds or patches, with soft mud bottom, covered with water to a depth of about one foot. There are many species of taro, both of the wet kind and dryland kind, which grows at an elevation of about 1,200 feet above sea level; this taro receives its moisture from the rain and dews. The water-grown taro is the staple article of diet, and forms the daily food of 95% of the Hawaiian people.

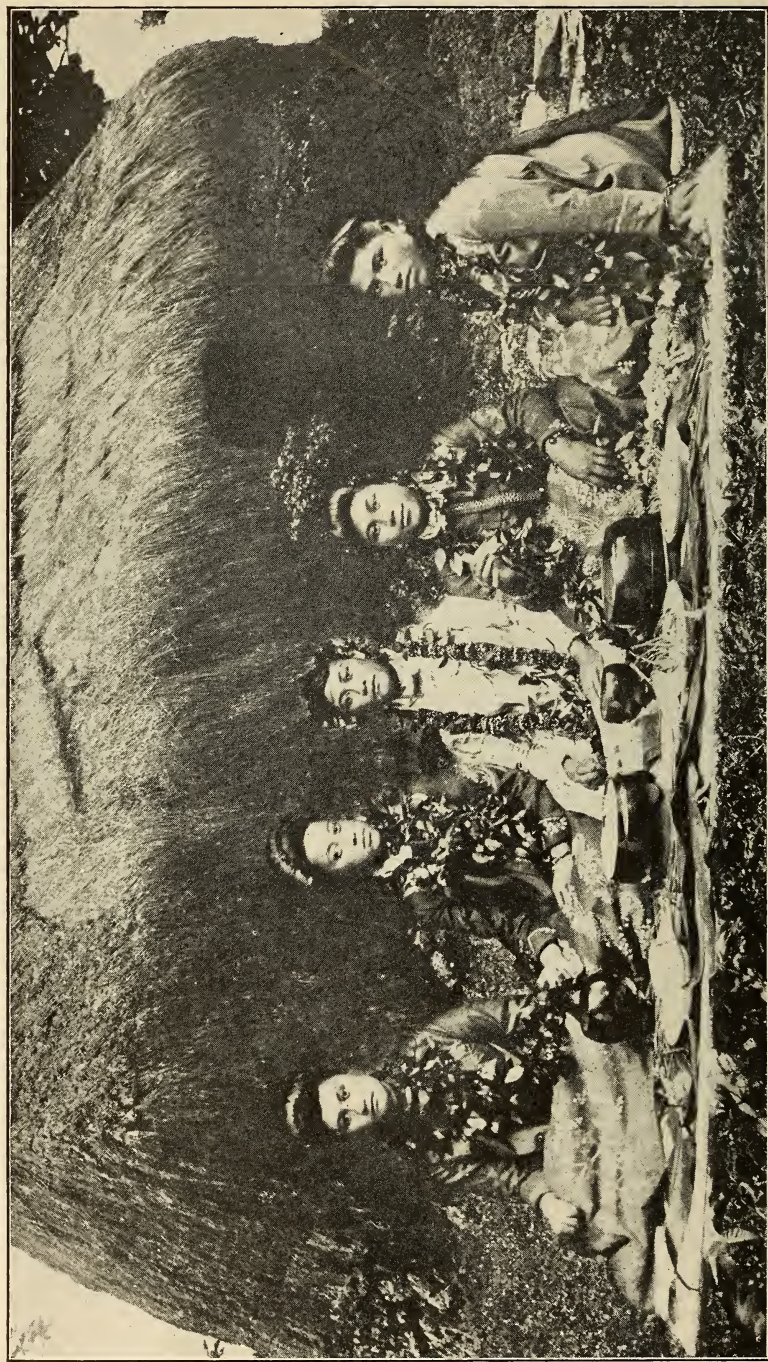
The root is cooked, peeled and pounded to a paste with added water. The flour paste of the bill-poster or the paper-hanger is poi counterfeited except for the color, and this flour paste poi is in common use today, instead of taro poi, owing to the high price of taro.

Poi is easily assimilated and is highly nutritious. Within a few hours after being freshly prepared it begins to sour, due to the starch largely present in its composition, taking on amylaceous fermentation.

The insipid taste of fresh poi palls on the Hawaiians, and they prefer poi which is two or three days old. Abundance of salt is also eaten with poi to remove its insipidity and lack of relish.

The containers for the poi are wooden bowls, calabashes (so-called) or true calabashes—large dry gourd shells, or porcelain bowls of foreign manufacture. The family calabash is of large diameter, rarely less than twelve inches, and when full contains an average depth of ten inches of poi. The calabash of poi is the recipient of all the fingers of the eaters who surround it and are in sufficient contiguity; these details fill in a picture of pleasure, health and ultimate satiety, provided all the eaters are healthy.

I will ask the reader to picture in his mind six people sitting



THE MEAL OF POI AND RAW FISH.

All of the girls eat with their fingers—no knives, forks or spoons are used. The risk of a communicable disease being spread by a common eating bowl is clearly in evidence.

around a dish, and all eating out of this dish with their fingers coated with flour, or starch paste, or poi, a tenacious compound requiring the finger to be deeply inserted into the mouth, and strong suction applied to remove the paste.

I now turn on the light of a morbidic current, and ask the reader to imagine what would happen to these six eaters, if some ignorant, thoughtless person semi-convalescent from cholera or typhoid fever (both primary mouth infective diseases), or a syphilitic with recent mucous mouth lesions, were to stir round this dish of paste or poi with unwashed, infected, and unsterilized hands, and begin eating and eating until he had finished his meal, and after him the six eaters began to eat the same poi or paste with its possible disease infecting contents—this same occurrence happening at the three daily meals.

Any person of common sense will admit, that the danger of infection from the above diseases to the six innocent eaters is very great.

Now this is exactly what takes place when a leper eats out of the same poi bowl with other healthy eaters. Amongst the Hawaiians the leper sits right amongst them, puts his fingers into the same food that they, the non-lepers eat, they know of his presence and avoid him not, and this condition goes on maybe for months or years.

Then one of the eaters with the leper develops the disease (leprosy): this makes two lepers. These two lepers remain eating, sleeping, and living with the other healthy occupants and another case of leprosy shows up later on; afterwards, either from immunity or some other accidental protective precaution (separate eating bowls, perhaps), no other inmates of the house develop leprosy, then the disease will be looked on as non-contagious by the surrounding neighbors. (This is the picture presented to us physicians in Hawaii, and it is not overdrawn, it occurs daily.)

FROM THE ABUNDANCE OF EVIDENCE AND VISIBLE PROOF OF THE SPREAD OF LEPROSY IN THE HAWAIIAN ISLANDS, IT IS HARD TO CONCEIVE HOW ANYBODY, LAYMAN OR PHYSICIAN, CAN DOUBT THE COMMUNICABILITY OR CONTAGIOUSNESS OF LEPROSY. WHAT DULLS AND BLINDS THE REASONING FACULTIES OF THE NON-CONTAGIONISTS IS THE SUPPOSEDLY SLOW PROGRESS AND DEVELOPMENT, APPARENT IMMUNITY SO MANY SEEM TO POSSESS, AND THE IMPERCEPTIBLE MAN-

NER, APPARENTLY, OF ITS COMMUNICATION, WHICH HAS LED THEM TO ASSUME THAT LEP-ROSY IS NON-CONTAGIOUS.

In contact with disease, the Hawaiian, without specially betraying his creed, is a believer and apostle of fatalism. Careless, even to recklessness, whether the disease be bubonic plague, cholera, tuberculosis or leprosy, with which he is in contact, the Hawaiian stands his ground, makes no attempt to move away from the point of infection or to protect himself or take any precautions whatever; but when he becomes a victim of a fatal disease two states of mind will be in evidence, utter sangfroid and stoicism, or pathetic appeals for aid when it is too late.

During the time I have lived in Hawaii—over thirty-two years—I have been amused and interested in observing the practice of the native doctors whenever opportunity presented itself. Implicit confidence is placed by the Hawaiian in the skill and learning of his kahuna, kauka, or doctor, but lack of confidence and fear generally is the rule when brought in contact with a foreign physician, who is lacking the essentials of Hawaiian practice, porcine and gallinaceous beliefs.

The native doctor is generally crafty, shrewd, and at times unprincipled. Whatever skill the ancient Hawaiian physicians possessed, in modern times like today it is a lost art, and most of its graduates belong to the university or school of superstition. The modus operandi of the Hawaiian doctor is as follows: Incantation for the recovery of his patient plays a minor role, as also do the medicines he administers, but he himself (the doctor) requires his fee and also that he shall be fed on the best of the land—succulent pig, chicken, gin or brandy and so forth. This high living is essential, for if the kauka becomes weak or feeble (a very common occurrence), the disease in his patient's head, lungs or stomach will get the best of him (the doctor) and then death stares the patient in the face. Therefore, the doctor must live on the fat of the land while his patient may starve.

Often times when the financial limit of the patient is exhausted and his death is becoming apparent, the kahuna, seeing no more prospective fees, and to save his own neck (being unlicensed) urges the patient and his friends to seek the services of a foreign doctor, telling them, "the nature of the disease has changed to a foreign sickness, and hence the need of a haole or foreign doctor!"

I have given dozens of death certificates, knowing full well



OUR HARBINGER OF HOPE.

We have here our Venerable Medicine Man—

Kauka Kukaepela, M. D. (Doctor Sulphur).

A Distinguished Member of the Faculty.

Note the placid features of the Kauka. He is taking his daily sun bath, and his favorite laau—popolo—this accounts for the Doctor's fine physique, and contempt for haole hair restorers.

Observe the Doctor's left hand possesses six fingers. The average white doctor has only four fingers, which amply suffice to abstract fees from his patients' pockets.



that I was covering up the work of a kahuna. What else could be done? the body must be buried, no evidence could be obtained proving negligence or malpraxis, and if prosecution was undertaken, acquittal would be certain, Mr. Kahuna would triumph and pose as a martyr of haole persecution. The average native judge gets "cold feet" in a kahuna trial.

The Hawaiians dread the power of the kahuna, regard him as an ogre.

To resume the consideration of the subject of poi.

Leprous bacilli can be found in the leper's calabash; this is highly significant, and is a striking indication that the leprous bacillus has a clear field for entering the digestive tract of a healthy person, eating out of the leper's calabash. The poi, of course, only acting as an *agent, medium, or factor* of conveyance of the bacillus leprae which originally was conveyed to the poi by the saliva-coated fingers of the leper.

EXPERIMENTS ON POI INFECTION

In order to test this method of infection, I experimented on twenty lepers during twenty-five years from 1884 to 1909, on every island of the group except Niihau.

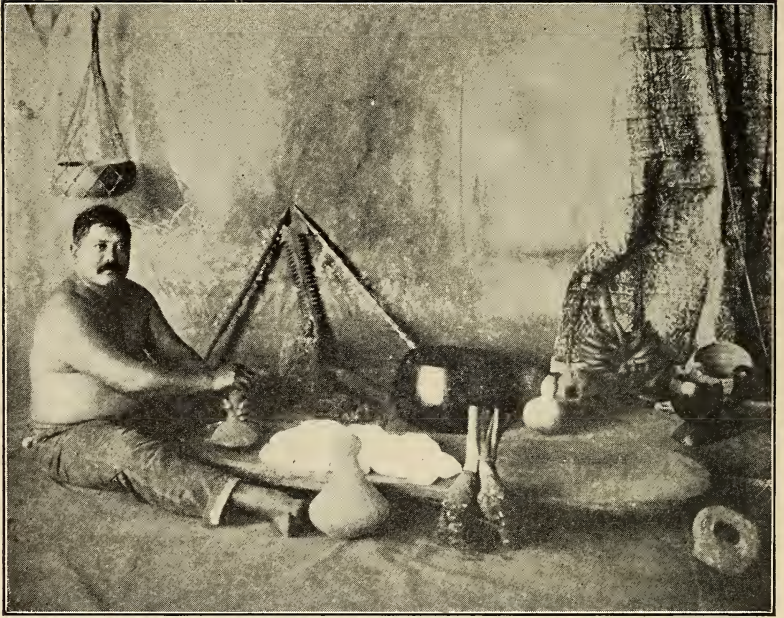
The leper was instructed to put his fingers to his lips, the index and middle fingers, and insert them well into the mouth as done in sucking off the poi; next step, the fingers were plunged into the poi, the exact spot being marked. Immediately a sterilized test tube of the largest size was pushed into the poi, at the spot where the fingers of the leper had been inserted. The cylinder of poi thus obtained was carefully examined, and in the whole series of twenty cases the bacillus leprae was obtained easily in every case.

Again, I secured the washings from the leper's calabash, when it was being cleaned, and also obtained bacilli.

Outside the body of the leper, his *awa*, his *salt fish*, and his *poi*, all contain bacilli, and possibly other articles of food also.

The saliva of the leper, a secretion in which it is reasonable to assume the bacilli are alive (and I claim that the saliva of the leper is not likely to contain cadaveric bacilli), is the only secretion in direct contact with the air, where non-cadaveric bacilli should exist—no clothing covers the oral orifice, hence direct transfer of the bacilli from this locality is more likely than any other.

The tears of the leper contain no bacillus leprae. The posterior nasal secretion contains bacilli which pass into the pharynx



PREPARING THE POI.

The pestle or pounder in the man's hand, the poi board or platter with poi, ready for placing in the calabash visible in the background. The taro plants, sheath and root in the foreground.

and back of the throat, they would therefore reinforce the bacilli at the back of the mouth and base of the tongue.

The secretion of the anterior nares, pouring out on to the upper lip, I claim, having free contact with the outer air, lacks infective properties, the bacilli are weakened, possibly cadaveric, and if some of this nasal discharge enters the mouth, which it must do at times and in sleep, mixing with the bacilli of the mouth, it will simply augment the numbers of bacilli in that cavity but not add to infective power of the saliva.

Rice, bread, crackers, raw fish cut in pieces will present less surface for infection by the leper's fingers than poi or salt fish. These former articles of food require less handling to detach a piece suitable for the size of the mouth.

In rice, a spoon is generally used for eating; if the fingers, the fingerful is pulled cleanly away, the remaining rice is not messed or mixed up by the leper's fingers.

This same statement applies to bread and crackers or biscuit if eaten whole, and not broken piece by piece in a common dish by leper fingers.

All these foods are less fingered than poi, which takes the first rank in finger contamination and in the depth of entrance of the finger into the mouth, the compression of the lips and cheeks aiding the strength of the act of sucking; the finger nails also aid the carrying of bacilli, practically the fingers with each plunges into the poi concentrate and mix in bacilli. The poi is cold when fresh, but the fermentative process always present after the first day, produces warmth which must aid the bacillus. Hot cooked food, or cooked over food would most likely destroy the bacillus, but fermentation would scarcely reach any damaging temperature high enough to end bacillary life.

One Hawaiian method of kissing, pushing the tip of the tongue into the opened lips and mouth of the kisser or kissed is a dangerous practice, if one or the other happens to be a leper, tuberculous or syphilitic, etc.

In Hawaii the leper receives the "maximum of contact" with the healthy, eating, sleeping, living in the same room, and the longer I observe these conditions the more I wonder that there are not more lepers.

The opinion is held by some, that the saliva-coated finger of the leper when covered with poi prevents any infection of the poi in the calabash, the bacilli contained in the saliva being sucked again into the mouth with the poi on the finger.

In a slow eater this condition is a plausible possibility, but the leper has generally a voracious appetite, due to his diseased stomach, and proceeds to scoop up the poi from the calabash as fast as possible, and during this process he scatters minute droplets of saliva, visible and invisible, over the surface of the poi, also with each plunge of the index finger, the bent second phalanx of the adjoining finger, together with the terminal phalanx of the thumb, come in contact alternately with the leper's mouth and the surface of the poi.

The presumption that the coating of poi on the leper's finger is of sufficient non-permeability to isolate a bacillus like the bacillus leprae, 3M (microns or micromillimeters) in size, a micron being equal to 1/25,000 of an inch, and also the fact that 10,000 bacilli could easily occupy the surface of an ordinary finger nail, throws grave doubts on the correctness of the above assumption *that a leper eating poi does not contaminate or infect it.*

I have stated already that in the cleansing of the leper's calabash the bacillus leprae can be detected in the washings, irrefutable proof that the leper does infect the poi.

SUMMARY OF CAUSES ALLEGED TO SPREAD LEPROSY IN HAWAII

Common to all Races	Indigenous and Peculiar to the Hawaiians
Vaccination.	Poi eating with leper.
Mosquitoes.	Eating raw fish with leper.
Bed-bugs.	Eating uncooked food with leper.
Fleas.	Excessive use of salt.
Pediculi.	Awa drinking with leper.
Sarcoptes Hominis.	Eating with fingers.

SOCIAL HABITS PECULIAR TO HAWAIIANS

Leper Contact	{	Intimate - - - - -	}	Marrying
		Prolonged - - - - -		Living
		Promiscuous - - - - -		Sleeping

RACES NOT EATING WITH LEPER

Practically all Caucasians and Asiatics

* * *

On the subject of pediculi or lice, sarcoptes hominis or itch,



CAUCASIAN-HAWAIIAN.

as possible spreaders of leprosy, I have grave doubts if either of these parasites could infect man with that disease; if an affirmative answer is given, "then these parasites must be looked on as spreaders of syphilis, tuberculosis, etc." What physician can assume this position? The direct entrance of the bacillus leprae must be looked for in the digestive tract, as I have before stated and discussed.

* * *

SIGNIFICANT CONDITIONS

The last American census, year 1910, enumerated

Asiatic-Hawaiians	3,734
Caucasian-Hawaiians	8,772

The Asiatic-Hawaiians are in the main comprised of Chinese-Hawaiians, who total possibly 90% of the whole. Leprosy does not prevail extensively among them, they are much less affected with that disease than are the Caucasian-Hawaiians, and both of these races suffer much less than the indigenous or aboriginal Hawaiian.

Exact figures are difficult to obtain, but a fairly accurate ratio of the prevalence of leprosy amongst each of these three races is as follows, computed for thirty years, 1884-1914:

Race	Unit	Ratio
Hawaiian.....	1 to	32
Caucasian-Hawaiian.....	1 to	140
Chinese-Hawaiian.....	1 to	210

LEPER POPULATION

Thirty Years (1884-1914)

Caucasian-Hawaiian	} One Leper to Every Seven	{ Aboriginal Hawaiians
Chinese-Hawaiian		

This ratio is figured on the list of segregated lepers for the above period of thirty years.

The Caucasian-Hawaiian is generally an eater of poi, due to the fact that the Hawaiian mother is usually the dominant consort in the matter of food supply, hence its more frequent use than rice or bread, due also the fact that in former years poi was much the cheapest of these foods.

As a general rule the Caucasian father is not as careful a provider, or as good a disciplinarian as he should be; laxness is the rule in both of these necessary paternal qualities. The daily food of the Chinese-Hawaiian, as long as he or she dwells under the paternal roof, is for the most part rice. The Hawaiian mother naturally, and from her bringing up, prefers poi to rice, and these two articles of food will be more likely to be found in her home than in the home of a Caucasian-Hawaiian family.

What I have written, some pages back, that poi is a much better vehicle for conveying leprosy "when infected by leper fingers" than rice, receives further support when it is apparent that the prevalence of leprosy is greater amongst the Caucasian-Hawaiian poi eater than amongst the Chinese-Hawaiian rice eater.

The evidence that I am continually deducing all has the same trend, and always points to the digestive tract as "the path of entrance of the destroyer" (the bacillus leprae into the human system).

A JAPANESE POI EATER

On the lands of a certain mercantile enterprise employing over 1,500 Japanese men, there lived a Japanese, one of the number of these laborers, and pursuing the same vocation as the majority of them, viz.: working in the fields.

This Japanese had resided in Hawaii for thirteen years, had always lived and worked on the same plantation. In the thirteenth year of his residence he became a leper, and for eleven out of thirteen years, until his leprosy showed itself, he had resided with a Hawaiian family. His diet was poi, which, of course, in a Hawaiian household forms the daily family meal three or more times a day.

This Japanese laborer had almost entirely discarded rice as his daily food, and he only ate that article of diet when he visited his friends.

When I first saw the man, although he had marked signs of leprosy, it had not become well known that he had this disease, but his Hawaiian house companions easily recognized it in its early stages.

I interrogated this Japanese and got his history as before related; it also came to light that in the Hawaiian house where he resided, there was a leper, a male Hawaiian adult, who ate promiscuously with all the members of the family and inmates of the house.

Here is an instance of one man out of 1,500 others developing leprosy under the very conditions that I assume are the means of spreading the disease amongst the Hawaiians.

I questioned this Japanese leper on his family history and contact with leprosy in Japan, and the possibility of his carrying the disease with him; his answers to all my questions negated the idea of his acquiring the disease in his home country.

Provided Japan was free from endemic leprosy, the history of this Japanese laborer would furnish very positive evidence on the point I have previously claimed, viz.: the leprosy carrying qualities of infected poi. The weak link in the chain of evidence is the bare possibility of Japan being the country where the primary infection occurred.

Thirteen years, however, is a long period of latency even for leprosy, which alternates its periods of activity and quiescence in a manner peculiar to itself, and different from all other known diseases.



CHINESE-HAWAIIAN.

CHAPTER III.

INOCULATION

Inoculation may be considered under two headings: Accidental, known or unknown, and Positive Inoculation.

Accidental inoculation infers the infection of a skin wound with no desire to acquire or produce pathogenic conditons.

Positive or deliberate inoculation may be defined as the insertion of a virus into a wound of the skin with the ultimate object of communicating a pathogenic infection.

My own experiments, extending over many years, have led me to conclude that leprosy cannot be inoculated on any dermal surface in man or animals by *ordinary methods*. This experience being in accord with the results previously attained by most workers in the field of inoculation.

In spite of the barren results obtained and the failure of the attempts to inoculate man with leprosy, there is a widespread idea and opinion held by many physicians and the laity in Hawaii, that inoculation is the mainly responsible agent for the spread of the disease. This fetich will not down, it dies a hard death.

The many years of toil and study that I have spent investigating the subject of, "where and how does the bacillus leprae enter the human system?" I have previously detailed in past pages, (all the facts deduced on this subject clearly indicating the digestive tract), and this evidence would appeal with greater and more convincing force to physicians in Hawaii, were they not enchanted and hypnotized by the song of the siren of inoculation.

To assume that the extensive prevalence of leprosy amongst the Hawaiians is due to inoculation, is a most unstable claim. Until leprosy can be demonstrated to be positively conveyed by inoculation, and inasmuch, even then, as no race has a possible monopoly of inoculation as a medium for communicating leprosy, it can hardly be conceived and accepted, that the *Hawaiian race is alone susceptible to inoculation*, and that all other races in Hawaii escape being infected with leprosy because they cannot be inoculated. This is a most untenable contention, yet it is the threshold on which believers in inoculation must stand in Hawaii nei.

INOCULATION EXPERIMENTS.

In the year 1844, Dr. Daniel Danielssen, Norwegian physician, veteran leprologist, (Danielssen's disease, Anaesthetic or Neural

leprosy being called after him), inoculated himself, two assistants and one nurse, attendants, at the Bergen hospital, with leprous blood, serum, and blood from leprous tubercles, and failed to infect himself or any of the others with leprosy.

In the year 1856, at the Lungegaarde hospital, Danielssen again inoculated himself, and four other persons, the same fluids of the leper's body being used. No subsequent infection with leprosy occurred in any of these five persons.

In the year 1858, Danielssen again inoculated two persons with the same leprous fluids, no resulting leprosy developed.

From the years 1868 to 1875 in Italy, Doctors Guiseppe Profeta, and Cagnina inoculated themselves and eight others with leprous fluids, blood and blood serum. The whole ten persons so inoculated failed to develop leprosy in a single instance.

If deliberate attempts fail to inoculate man with leprosy, it must then be a vague and doubtful possibility whether man can be inoculated by accidental and unknown conditions.

In previous pages I have brought forward the vast field that European leprosy affords us, to ponder over and consider, and the great aid it gives us in studying the disease in Hawaii. In Europe a disease that numbered its victims by millions, ultimately almost became extinct, can scarcely be claimed to be a disease spread solely by inoculation.

Syphilis has been known for many centuries to be inoculable, but there are no present indications of the disease dying out.

We do not know that leprosy is inoculable in man. Were we positive in our knowledge that it was, would we expect it to become extinct?—the answer must be NO, for in the absence of rigid preventive measures, any inoculable disease widely spread, is very unlikely to disappear, and certainly not a chronic infective disease like leprosy.

Syphilis, an inoculable disease remains with us, and no country is free from it; on the other hand leprosy for the most part has ceased to exist, but yet maintains itself by certain endemic centers in a few countries.

All the evidence in Europe tends to strengthen the non-inoculable character of leprosy, otherwise we must be led to accept the statement, that a "disease which scourged Europe for 600 years and over, died out of its own accord, was spread by inoculation," a deduction open to grave criticism, because this source of communication, (inoculation) existed from the beginning, all through the course of the disease, even to the end, remains today as a universal

cause; and the same field for its spread is as open as ever; yet, only limited areas of certain countries contain endemic centers.

INOCULATION EXPERIMENTS ON KOKUAS AT MOLOKAI.

In the *incipient* stages of leprosy, it is natural to conclude that it would be possible to start *fresh foci* of disease in clean, and uninfected parts of the body of a leper by inoculation. If we could successfully accomplish this, it would be a great advance and we could learn much more about the etiology, the inoculability, period of incubation, etc., and make definite progress in our knowledge of the cycle or life history of the bacillus leprae.

This is one of the first snags I encountered in investigating the pathogenic features of leprosy; the creation of "FRESH FOCI" of leprous infection in the leper cannot be accomplished, I never succeeded in doing so, the many experiments I carried out on this "LEPROUS RE-INFECTION" basis all ended in failure.

Whilst the non-successful production of new infection centers, weakens the probability of certain local lesions of leprosy being of purely local origin, it by no means negatives the position maintained by some leprologists, that in certain lepers, leprosy has well defined local foci of disease, which if eradicated by excision, general systemic infection will be lessened or stopped.

To proceed. Thirty years ago the Leper Settlement on Molokai maintained abundance of healthy kokuas, all ready and willing to be experimented on by inoculation, serums, or any other means likely to develop leprosy; the artificially made lepers hoping to obtain board and lodging, for the remainder of their lives; being listed as lepers—a livelihood, and existence without working being provided by the Board of Health.

What other country of the world save in Hawaii, would people be found willing to take the chances of acquiring a loathsome and incurable disease?, the sole object to be gained for the loss of health and shortened lives, *being maintained at public expense*. From the Hawaiian point of view no risk attends a careless contact with leprosy; this condition alone ought to furnish sufficient evidence to the world, and account for Hawaii being a strong, and prolific endemic focus for that disease.

Amongst the greater number of the 225 male and female kokuas residing at the Leper Settlement, in the early '80's, there was an ever present desire amongst them to be placed on the books and listed as lepers.

I was pestered and annoyed daily with requests to examine purposely caused lesions of the integument, generally consisting of incised, contused, or lacerated wounds, wilfully allowed to fester, and become ulcerated, aided and aggravated by irritating substances, salt, tobacco juice, sulphur, kerosene oil, acrid juices from raw taro, awa, soot, salt petre, and a multitude of other substances all calculated to produce superficial or deep inflammation of the skin.

Feigned pains, aches, paralyses and anæsthesia, all made to order, to fool the doctor. To imitate the leprous alopecia of the supra-orbital ridge—plucking out, and burning of the eyebrows was resorted to; counterfeit leprous ulcers of the plantar surface of the feet were also common forms of malingering.

A splendid field for experimental work was at hand, and stretching all questions of professional ethics, I did not hesitate to avail myself of the opportunities afforded me for testing the inoculability of leprosy. My chief regret is that I have so little to offer in results obtained on this much debated question.

Over a period of three years, I selected ten male kokuas, and five female kokuas, suitable in every respect as subjects for experimental inoculation.

A preponderance of cases of leprosy generally develop between the ages of 20 and 35 years; there is apparently at this period of life some real or apparent susceptibility to the disease, and these fifteen selected kokuas fell within the above age period.

"A." Male Hawaiian kokua, 31 years of age, free from leprosy, had resided four years at Kalaupapa with his leper wife, her disease being of six years standing.

This man claimed that various sores on his arms, body, and legs were due to "Mai Pake" or leprosy, and demanded that he be placed on the books of the Settlement and listed as a leper.

The imposition was easily apparent, the wounds on the skin being self inflicted with hot tobacco ashes, afterwards salt and kerosene oil being rubbed in. I taxed "A" with causing his own sores, he stoutly denied any malingering practices, and claimed his skin lesions were truly leprous, and he could produce witnesses to prove it.

I informed "A" I would use certain measures to decide his case. He specially stipulated his non-desire for hypodermic treatment, but agreed to submit to any other medicines I might see fit to use.

Daily, both the dispensaries at Kalawao and Kalaupapa, offered abundant supplies of leprous serum from burn vesicles, (due to

thermal anæsthesia) and steam scalds. Leper patients applying for remedies to dress these injuries, furnished this fluid from blisters, caused by the contact of heat and steam on their hands and feet. The loss of sensation, due to various tropho-neuroses, causes the lepers to acquire extensive skin lesions due to contact with fire, boiling water, and steam.

These vesicles yield varying amounts of serum, from a teaspoonful to several ounces or more. This blister serum is rich in bacilli leprae.

Hawaiians have a marked dislike for hypodermic injections, whether morphine be used or any other drug, fluid or other vehicle. I rarely could persuade any Hawaiian to submit to the use of the syringe to administer leprous serum. However, in one or two instances I succeeded in doing so.

In the month of December, 1884, I took up the case of this man "A", and scarified three centers for inoculation with leprous serum, one, inner surface left forearm; second, base of neck near sternal end of left clavicle; third, left side of abdomen near the umbilicus. At all these scarified points leprous serum was thoroughly rubbed in with a lancet. The sores on his arms, legs, and body were cleansed with warm creoline solution, and afterwards dressed with borated vaseline, to each ounce being added 4c.c. of blister serum; the patient to dress his sores twice a day, the morning dressing being made by my dispenser.

At the expiration of eight weeks the three points of inoculation had healed, were barely visible; some of the old ulcers on the limbs and body, had lessened in area, others no improvement, and so the case progressed from month to month. One year after inoculation there were no signs of leprosy; shortly after I again inoculated two foci on the pectoral muscles.

Up to the year 1895, when "A" died of acute nephritis, the result of alcoholic excesses, no signs of leprosy had showed themselves; a period of over eleven years having elapsed from the time of the first inoculation. Three other competent physicians examined "A" in 1895 and pronounced him not a leper.

"B". Male Hawaiian, 28 years old, lived at Kalaupapa, and took care of his mother, who had leprosy for five years.

This man "B" claimed he had leprosy, on the strength of most of the integument of his body, limbs, and face being affected with the psoriatic change produced by drinking awa. Patches of tinea versicolor were scattered on the neck and dorsum.

I explained to "B" that his skin trouble was not leprous, and

on questioning him he admitted his desire to acquire leprosy, which would prevent him being ejected from the Settlement, (as an undesirable, which he was, and lived up to the name), on the death of his mother.

In the month of December, 1884, I scarified a patch of "B's" skin the size of a quarter dollar, over both lumbar regions, and rubbed into these scarified spots a liberal supply of vesicle serum, and blood obtained from a young leper woman.

At the end of two months the inoculated foci showed a little discolored skin, and a small blister applied to these inoculated spots, by painting cantharides collodion, gave a vesicle fluid devoid of any leper bacilli.

"B" is alive today (1914), left the Settlement in the year 1902, after a residence of 18 years. He shows no signs of leprosy.

"C." Male Hawaiian, kokua, aged 24 years, living at Kala-wao, with his leper wife. In the same month, and at the same time, December, 1884, as "B", was inoculated. I performed the same operation on "C", inoculating a sore in the web between the finger and thumb of the left hand, using blister serum and leprosy blood; the wound healed at the end of two months, no signs of leprosy ever showed themselves. In the year 1908, twenty-four years after inoculation, "C" died on Maui of cardiac disease.

"D." Male Hawaiian, kokua, 31 years of age, living at Kala-wao with his sister, a leper of eight years duration.

At "D's" own request, and to refute his claim of being a leper, I inoculated four foci with leprosy serum in the month of December, 1885. The inoculated spots chosen were, inner surface each thigh, at base Scarpa's triangle; and both inguinal regions. "D" married a leper woman; he never developed leprosy, lived 24 years at Kalaupapa, and then moved to Honolulu. I occasionally see him on the street—he shows no signs of leprosy or any other ailment.

"E." Male Hawaiian, kokua, 25 years old, has a leper wife, her disease being of four years' standing.

"E", because of rheumatic pains, and patches of leucoderma on his hands, feet, and nape of the neck claimed he had leprosy. He had lived one year in the settlement, and had been examined by several physicians, amongst them Dr. Arning, who failed to find any bacillus leprae in his tissues or secretions.

In April 1886, at "E's" own request, I inoculated him over the left pectoralis major, immediately above the nipple, the site chosen was the seat of extensive pigmentary deposit of tinea versicolor. A scarified patch size of half a dollar was thoroughly coated

with leprous serum, and *saliva* furnished by his wife. The scar remained visible for six months, and six months later, April, 1887, a section of the scar failed to reveal any bacilli.

At this date I inoculated "E" the second time, with blood and blister serum, on the inner surface of his left forearm, midway between the elbow and wrist. Fifteen years afterwards in the year 1901, "E" showed no signs of leprosy. He had had two leper wives, and on the death of the second, left the settlement; was pronounced not a leper sixteen years after the first inoculation. Since "E" left Molokai, I have lost track of him.

"F." Male Hawaiian, kokua, 29 years old, his leper wife died five years ago, in the year 1880.

On September 10, 1885, "F" appeared at the dispensary at Kalawao, and applied for treatment for gonorrhoea, multiple deeply excavated soft chancres on the fraenum, and glans penis, double inguinal buboes. Under the use of sublimate lotions, a dusting powder of boric acid and iodoform, his chancres and gland trouble showed improvement, his gonorrhoea slowly yielded to injections of 1 to 500 zinc chloride solution.

"F", like all the previous cases I have related, was anxious to contract leprosy, and he broached the subject to me several times, and requested me to enter his name on the leper list. He was not a leper, and I declined to do so. With his permission on two occasions, at intervals of a month, I administered hypodermic injections of 4c.c. of leper blister serum, making the injection intramuscular, into the right buttock. After the second injection, "F" refused any more, although no inconvenience, abscess, or tenderness followed the two previous ones. It took four months for the buboes to heal, and during the later part of the treatment "F" used my favorite application in such cases—borated vaseline and 4c.c. of blister serum added. Up to January, 1888, "F" never developed leprosy; twenty years afterwards, and twenty-three years after, I had given him the injections of leper serum, "F" showed no trace of any disease. He had married three leper women, and when the last one deceased, he was sent out of the Leper Settlement, charges of gambling, and illicit alcohol distilling being registered against him.

"G." Male Hawaiian, kokua, aged 26 years, went to reside at the Settlement in 1884, with his sister, a leper.

"G" was a confirmed awa drinker, presented a most repulsive appearance—purulent ophthalmia, thickening and eversion of the upper and lower eyelids, bright scarlet conjunctivae, and his entire

body a mass of awa scale—patches of rupia formation in places, and foul ulcers due to neglect, dirt and foul living, excessive use of awa, and salt foods. "G" informed me he was a confirmed leper, everyone so stated, and the people of the Leper Settlement thought me a very poor doctor because I failed to recognize and accept him as a leper, and so list him on the books of the Settlement. He further informed me that my obstinacy and stupidity in not listing many other kokuas as lepers, was one of the reasons so few lepers called on me for assistance. I let "G's" tirade wear out, they were weekly repetitions, and finally I informed him that I would find out shortly, if he was a genuine leper; he was to call around next day.

I shaved, cleaned both axillae, the only apparently non-diseased dermal surface remaining, scarified two foci in each axilla on the arm and chest surface, and thoroughly rubbed into the scarified surfaces about half a teaspoonful of leprosy serum; the points of inoculation readily healed.

Twelve months afterwards, sections of the skin of the inoculated spots failed to reveal any bacilli.

I inoculated this man in May, 1886, and he died a non-leper in 1897, eleven years later, from acute alcoholism.

"H." Male kokua, Caucasian-Hawaiian, 31 years old, segregated in 1883 as a leper. After residing ten months at Kalawao, "H" was pronounced a doubtful case, and was returned to Honolulu for further examination. There he was declared a non-leper, liberated for six months, then re-declared a leper, and again sent to Molokai. There are very many cases similar to "H's". The same measures, examination, re-examination, arrest, and freedom have been carried out.

The only pronounced signs of leprosy visible on "H" were atrophy, paralysis of the interossei muscles of the left hand, wasting and paralysis of the forearm extensors, extreme flexing of fingers on palm, ectropion with constant lachrymal discharge flowing on to the cheeks. The phalanges of the right large toe had been destroyed by absorptive caries and necrosis, a large healed ulcer was revealed at its favorite seat, the junction of the meta-tarso-phalangeal articulation, the ball of the toe—a pressure ulcer due to nerve supply defects (Trophoneurosis).

Although past ravages of leprosy were in evidence no bacilli could be detected. The case being one of aborted leprosy, and a species of leper carrier which I have previously described.

"H" requested me to determine if possible the absence or

presence of leprosy, and to this end I inoculated him with leper serum on a surface about the size of a half dollar, over each lumbar region. Six months afterwards a discolored area of skin, corresponding to the point of inoculation, alone remained to indicate the seat of operation. He died in 1901 at Kalaupapa from acute dysentery. From the date of inoculation, February, 1887, to the year of his decease, no active development of "H's" latent leprosy took place.

"I." Male Hawaiian, kokua twenty-four years old, his wife a Chinese-Hawaiian, a leper, had resided three years at Molokai.

"I" was affected severely with tertiary syphilis, and had ulcers on the anterior tibial surfaces of both legs, necrosis of the nasal bones, perforation of both the hard and soft palate.

It is a repetition all through these cases, kokuas alleging infection with leprosy, and clamoring for rations granted to lepers.

Dr. George Fitch, (the same who claimed leprosy to be the fourth stage of syphilis, account of which I have written of in earlier pages of this book) had treated this kokua "I", giving him 40 grain doses of potassium iodide, three times daily for months. Under this treatment the symptoms, and active lesions of syphilis improved, and the large area of ulceration on the legs would heal; on the discontinuance of the iodide all the symptoms would break out again.

"I", like all the cases I have previously related, was eager to get leprosy, or have his syphilis called leprosy, and expressed his desire to undergo any treatment or means which would accomplish this end. I therefore decided to try inoculation with leper blister serum, always hoping I might succeed in each case, and determine the possibility of inoculation. Level with the umbilicus and three inches external therefrom, I made two centers of inoculation the size of a dollar, in the month of October, 1885. I watched the case until 1888, but "I" never showed any signs of leprosy—his syphilis remained stationary; he died in the year 1897 of locomotor ataxia, cerebral hemorrhage being the immediate cause of his death. Dr. Oliver, who had watched the case, failed to detect any leprosy manifestations during the twelve years "I" lived after inoculation.

"J." The tenth, and last male subject on which I performed inoculation, was a male Hawaiian kokua, who had resided six years at Kalaupapa.

In January, 1887, at his own request, to decide if he was a leper, I inoculated "J" between the shoulder blades, and in the lumbar regions; made three foci, and scarified the wounds deeply, well into the deep layers of the skin. Thirteen months afterwards

sections of skin from the points of inoculation were examined by two physicians, and each of these acting independently of the other, pronounced the specimens free of bacilli.

INOCULATION EXPERIMENTS ON FEMALE KOKUAS.

"O." A female kokua, Hawaiian, 28 years of age, husband three years a leper, and a very bad case. This woman used awa to excess, and alcohol also; led a very dissolute life, increasing her pocket money by prostitution, in which she was aided and abetted by her husband. She had gonorrhoea, with profuse purulent vaginal discharge, chancres on the labia and abundance of venereal warts scattered about the vulva.

"O" strenuously insisted she had leprosy, and accused me of displaying prejudice against her, and favoring the claims of other kokua women by listing them as lepers.

This case was an excellent one to determine whether the vagina was a permanent seat of the bacillus leprae. Never once did I succeed in finding bacilli though all her many consorts were lepers. "O" made no fuss or objection to the use of the hypodermic syringe, and I gave her 1.c.c. injections of leper vesicle serum every month. When her chancres had been cleaned, and disinfected, I had her use borated vaseline and leper serum added as described in previous cases.

I watched "O" for two years, but no signs of leprosy ever appeared, and shortly afterwards, in the interests of law and order she was ejected from the Settlement. I examined "O" for leprosy in the year 1898, twelve years after the serum injections; she was not a leper.

"P." Hawaiian female kokua, aged 25 years; husband a leper five years. This woman was very uncleanly, her skin was scaly—patches and crusts covering the entire trunk, thighs, nates, and axillæ, mostly due to the *sarcoptes hominis*, or *feminæ*.

Extensive ulcerated surfaces existed on the nates, and inguinal regions, front of the thighs. The groins were the seat of ulcerating buboes, both the inguinal, and femoral glands being affected.

This woman loudly asserted whenever she saw me, that she had the "Mai Pake" and clamored for rations, as she and her husband had to exist on his one ration. Previously this woman had been declared a leper, and later on this declaration was revoked, and she was listed as a non-leper.

Under persistent sulphur treatment and tonics "P" improved,

much to her own surprise, and she was not pleased with the change as the prospect of her rations and general care by the Board of Health vanished.

"P" had profuse and fetid leucorrhoea, cervical catarrh and ulcers of the cervix. After these troubles were much relieved, and the genital passage free from pus, I repeatedly searched the vaginal secretions for bacilli, but never could find them.

With the patient's consent, I freshened up old chancres of both mucous and dermal surfaces of the labia majora, and rubbed well into their surfaces, leprosy vesicle serum and blood. Four times I so inoculated "P" at intervals of four months, the results were the same as in previous cases recorded—no leprosy developed, from 1887, date of inoculation, to the year 1900 when "P" died of fever. Her first husband died in 1890, and then she married a second leper husband who survived her.

"Q." Hawaiian kokua, female, 35 years of age, had lived fourteen years at Kalawao, and had four husbands and three children, all of whom, the husbands and children, died of leprosy. Her first husband, with whom she had three children, all lepers, died a leper. Husband No. 2 was a kokua, developed leprosy two years after his marriage to "Q", and died shortly afterwards. Husband No. 3, was also a clean kokua. One year after his marriage to "Q", he became a leper and died three years after the disease showed itself.

"Q" was petite, and very comely and graceful, remained a widow for four weeks, when husband No. 4, a mere youth came on the scene. Within one year he developed leprosy and died eighteen months afterwards. No children were born with her three latter husbands.

"Q" decided she had had enough husbands, and refused the advances of all other suitors. She did washing, sewing, hat making and mat making for a living.

Naturally the speedy way in which all the husbands of "Q" became lepers caused considerable comment and gossip; she was examined by many physicians, and all pronounced her not a leper. "Q" was very clean and neat in person, her skin was free from blemish. I searched her nasal secretion, the saliva, the blood, its serum, faeces, and vaginal secretion, and had the same examined by other physicians; no bacillus leprae could be detected.

At one period of my residence at Kalawao, I had difficulty in getting my wearing apparel washed and laundried, and being in considerable pilikia, I engaged "Q" to wash for me, my usual

washerwoman having died, and as a physician at the Settlement requires no elegant starched bosom shirts or Beau Brummel clothes, a very modest wardrobe suffices.

In due course, "Q" showed up all ready to begin washing, and scarcely had she rolled up her sleeves, when Father Damien came racing along to my house, and begged and implored me not to employ "Q," offering to obtain the services of another kokua washerwoman.

Father Damien recounted all "Q's" past history, and how husband after husband had fallen victims to leprosy, all of which I knew.

I did not discharge "Q," as I felt no fear of getting leprosy through her laundry work for me; she was clean and neat, neither drank alcohol, nor smoked, and was no doubt immune to leprosy.

I may say here that Father Damien was most careless and reckless in his associations with lepers, seemed perfectly indifferent as to whether he fell a victim to leprosy or not. I repeatedly scolded and rebuked him for having leper cooks and servants, he turned a deaf ear to all my remonstrances; yet he displayed genuine concern and alarm when he thought I was taking an undue risk, by employing "Q" to wash my clothes.

This woman "Q" had fears that she would be deported from Kalawao. During her fourteen years of residence all her friends and relations outside had died, and she regarded herself as a homeless outcast, if she had to remove from the Settlement.

I regarded "Q" as immune, as are numbers of the Hawaiian race, but *immunity cannot be definitely determined until prolonged contact with leprosy has taken place.*

"Q," apparently one of the Hawaiian race, lacked the thick lips, wide nostrils, and broad nose from tip to base, of the pure Hawaiian; her type was East Indian and Hawaiian, and I pondered over the idea, wondering whether some previous Indian ancestor had not conferred immunity on "Q," which in part accounted for her resistance to infection.

"Q" was perfectly willing to acquire leprosy, if such a condition could be brought about; she was perfectly indifferent as to the ultimate result—she would gain her chief desire, life-long residence, food and lodging. I acceded to her importuning and on two occasions at intervals of four months, I injected 2 c. c. of leprous vesicle fluid into the lumbar regions, 1 c. c. into each flank. The second injection, later on, was made between the shoulder blades, and also into the abdominal muscles below the ribs, in the mid-axillary line. Of the many instances in which I injected

this vesicle serum, "Q" was the only case where marked reaction occurred; headache, chills, fever temperature 103.6, bodily pains, nausea, and profuse sweating, all followed the injections for four succeeding days. This reaction scared "Q," she thought I proposed to kill her right off, and any further injections were declined.

"Q" lived fifteen years after being inoculated, but no leprosy ever appeared; she had lived twenty-nine years in contact with the disease.

"R" Kokua, Chinese-Hawaiian woman, aged twenty-four years, husband Chinese-Hawaiian, a leper, had resided two years at Kala-wao, since spring of the year 1883.

In March, 1885, "R" came to the dispensary for relief from skin troubles, consisting of eczema impetigo, scabies, multiple ulcers of legs, abundance of warty condylomatous growths on both labia and round the anus—ulcerating inguinal buboes.

"R" claimed she had leprosy and pala or syphilis, and had been so informed by Dr. George Fitch, who had also treated her.

I could not satisfy myself that her skin and other troubles were due to syphilis, so used no antisyphilitic remedies.

"R's" genital passage was free from disease and from bacilli, which I was always seeking in order to confirm or eliminate the vagina as a permanent seat of the bacillus leprae.

Creoline solutions and sulphurated potash baths worked improvement in "R's" skin troubles, and later the large ulcers were dressed daily at the dispensary with borated vasaline and leprous vesicle fluid added. This woman, anxious to obtain rations, wished to be listed as a leper. After three months' treatment "R" was much improved, I afterwards gave her 30 grains of potassium iodide with iron potassium tartrate, her ulcers and other troubles changed for the better as long as treatment was kept up; ceasing to use the remedies, a relapse immediately took place. I lost sight of "R" and forgot all about her case.

When warm medicated baths were installed at the Settlement the lepers using them derived immediate benefit, and their general health and comfort were greatly improved. "R" took medicated baths twice a day, and when I saw her last in the year 1898, she had to remind me who she was, so great was the change in her appearance, that I failed to recognize her. Her syphilis was practically eliminated, if she ever had it, and her freedom from leprosy was only too apparent.

"R's" first husband had died; afterwards she married a second leper husband, with whom she had two children, both free from leprosy.

"S," Hawaiian female, twenty-six years of age, born at Kalaupapa on holdings, homesteads outside the control of the Board of Health, for all purposes she was one of the Leper Settlement residents. These original residents (kamaainas) continued to live unmolested alongside the leper homes for twenty-nine years, then the holdings were condemned and the dwellers thereon expelled from the Leper Reservation. "S" was one of these kamaainas. None of them ever developed leprosy; there were 38 or 39 of them, male and female. "S" married a kokua, he subsequently contracted leprosy four years after their marriage. They had no children. "S" claimed to be a leper on very poor evidence; she, like most other kokuas, had no desire to leave Kalaupapa. Her hands and feet were devoid of sensation, but there were no changes in the skin, muscular structure, or blood vessels. "S" had gonorrhoea, cystitis, ovarian and uterine disease, was addicted to taking alcohol in excess (the home-made kind), and these drunken debauches would be continued for days.

"S" had been repeatedly examined in Honolulu for leprosy, the decision always being not a leper. She used to be a frequent visitor to the dispensary at Kalaupapa. I inoculated her on different occasions with blood and serum obtained from facial lepromae of her husband, on the arms and back at intervals of four months. These inoculations were made in November, 1886, and when she was examined by a medical commission nine years afterwards, in the year 1895, no leprosy was in evidence, and she was ordered deported with the other kuleana holders on the condemnation of their homesteads.

In the year 1904 "S" was not a leper. She had lived over thirty-five years altogether, in contact with leprosy.

Neither gonorrhoea nor syphilis affect leprosy; each runs its course irrespective of the other.

The record of FIFTEEN inoculations of kokuas with leprosy fluids shows every case was a FAILURE and produced no results.

A CELEBRATED CASE

Within the past twenty-five years, *two events* connected with the history of leprosy caused the eyes of the world to become focused on Hawaii, gave these islands prominent and unenviable notoriety, and caused them to be regarded as a focus of endemic contagious leprosy.

First, the successful inoculation or alleged inoculation of Keanu, the Hawaiian murderer.

Second, the infection of Father Damien, Catholic priest at the Leper Settlement, who fell a victim to nodular leprosy; together with the rapid progress and fatal issue of his disease.

(a) The case of Keanu fails to carry conviction on the absolute inoculability of leprosy, because the operation performed on him was not one of legitimate inoculation; a better definition would be transplantation of leprous flesh.

(b) The infection of Father Damien illustrates what may happen to anyone who is careless and imprudent in contact with a contagious disease, and cannot be construed to indicate that *leprosy is positively* contagious to all contacts.

I will now give a brief history of the case of Keanu, the Hawaiian murderer, whose death sentence was commuted to imprisonment for life, with the added proviso "that he submit to inoculation with leprosy." Under no circumstances was he to be pardoned and given his freedom, as has been stated in certain mainland publications.

KEANU, THE MURDERER

In the gray dawn of the morning of February 16, 1884, on a lonely and unfrequented part of the Kohala-Waimea road in the district of Kohala, island of Hawaii, Keanu, a Hawaiian, clubbed, beat in the skull with a wooden bludgeon, and murdered Charlie, a Japanese of diminutive stature and feeble strength. This Japanese with the "haole" name of Charlie, was married to Kamaka, a Hawaiian woman, and the illicit and clandestine liason between Kamaka and Keanu led to the murder.

Keanu determined to get the Japanese out of his way, and he premeditatedly murdered him under the circumstances before stated, purposely waylaying the man, addressed words of welcome to him, pretending friendship when he encountered the Japanese, he threw him off his guard, assaulted and beat him to death without provocation.

In due course the body of the murdered man was discovered; suspicion pointed to Keanu, and Kamaka gave damaging evidence against her paramour.

Keanu attempted to prove an alibi, asked for change of venue from the Hilo Circuit, which was granted May 8, 1884, by

Judge Lawrence McCully, and the case was transferred to the July term of the circuit court at Honolulu.

Before Chief Justice A. F. Judd on July 9, 1884, Keanu was arraigned for murder in the first degree. He pleaded not guilty, his counsel being Kaulukou and Poepoe.

Paul Neuman, attorney-general, and Austin Whiting, deputy attorney-general, appeared for the crown.

The trial occupied two days, the direct and circumstantial evidence strongly implicating Keanu. The jury brought in a verdict of guilty as charged—murder in the first degree.

Keanu's counsel applied for a new trial, advancing the usual well-worn pleas that the verdict was contrary to the law and evidence.

Five days after the jury's verdict had been rendered; on July 16, 1884, the Supreme Court sat and heard the arguments of Keanu's counsel for a new trial.

Under the judicial procedure then in force, the trial judge also sat as a reviewing judge, together with the other associate judges of the Supreme Court.

At the hearing of Keanu's appeal for a new trial, Chief Justice A. F. Judd, Associate Justice Lawrence McCully, and Associate Justice J. J. Austin, occupied the bench.

Two days after the hearing of the evidence for a new trial the Supreme Court, on July 18, 1884, unanimously denied the motion, and Keanu was sentenced to be hung on the last Tuesday of October (28), 1884.

Chief Justice A. F. Judd was an excellent and competent Hawaiian scholar, and for Keanu, if he had the slightest possibility of proving his innocence, no better judge could have sat on the bench to aid him than the late Albert Francis Judd.

Keanu, at the time of his sentence to death was forty-eight years old, his physique was massive, and his weight at least 250 pounds, broad-shouldered, and of erect carriage, about 5 feet 10 inches tall—he was a formidable antagonist for the average man to tackle.

I have not been able to get access to all the documents in the case, but I was informed by the late Dr. George Trouseau, "that the Board of Health petitioned the late King Kalakaua's Privy Council of State to commute Keanu's death sentence to life imprisonment, and for the advancement of science he (Keanu) was to submit to inoculation with leprosy." The Privy Council acceded to the petition and its terms.

INOCULATION OF KEANU

Keanu was confined in Oahu jail, and on September 30, 1884, he gave his written consent to Dr. Edward Arning to inoculate him with leprosy.

Dr. Arning excised a leproma, about the size of a small hen's egg, from the cheek of a young leper girl and transplanted and embedded this leprous flesh into an incision, which laid bare the belly of the supinator radii longus muscle of Keanu's right forearm; the leprous tissue or leproma was sutured in position.

Twenty-five months after this operation, October, 1886, Keanu showed the maculation of nodular leprosy all over his body, the nerves and lymphatic glands near the seat of the wound also showed implication. The infection in the various selective seats of the body peculiar to leprosy became apparent (ear lobes, helix, cheeks, forehead, supra-orbital alopecia, etc.), in the year 1887; in the fall of that year, some three years after inoculation, Keanu was a confirmed leper, apparent to all the inmates of the jail, wardens and prisoners.

I examined Keanu in February, 1888, at the request of the United States Minister, G. W. Merrill, at the Oahu jail; the details of this examination were forwarded to Washington.

All through the year 1888 Keanu's leprosy progressed rapidly. He became a menace to the prisoners in the jail; no proper accommodation for him existed in the hospital of the prison, therefore it was determined to remove him to the Leper Settlement on Molokai, where all facilities existed for the care of lepers.

Keanu was transferred to Molokai, landed at Kalaupapa February 6, 1889, and died at Kalawao, November 18, 1892, eight years and fifty days after his so-called inoculation with leprous tissue; he had then reached the age of fifty-six years.

Twenty-five years ago, the average duration of life of a Hawaiian affected with nodular leprosy was about eight to ten years, so that Keanu's tenure of life was about that of the average leper.

Dr. Swift, who resided four years (1888-1892) at the Molokai Leper Settlement, made known the fact that Keanu's relatives were affected with leprosy, and that he (Keanu) had lived in the same house with these leper relatives. This discovery raised the question whether Keanu was a leper previous to his inoculation.

Most old residents of Hawaii know well that the Hawaiian family relations are described in a very loose and careless fashion by the Hawaiians themselves; such appellatives as cousin-brother, cousin-sister, brother-cousin, and sister-cousin mean what? Even

today a man frequently has plural wives, he will live and cohabit with his married wife and her sister; the reverse—one wife with two husbands—is even more common. Punalua is the technical term used in these cases. These intimate relations are not peculiar to Hawaii, they exist in many countries.

In the case of Keanu, his maternal cousins, so-called, had leprosy before he did, and they may have been in reality his own brothers and sisters, viewing the matter in the light of the peculiarly loose and bewildering family relations and associations maintained in Hawaii.

All the data and features connected with Keanu's case cannot determine the question of the inoculability of leprosy in man. By no such possible method could the average person accidentally become infected with leprosy, similar to the measures pursued in Keanu's case.

Transplanting and imbedding leprosy tissue into the healthy person cannot by any manner of means be termed inoculation, which I have defined at the beginning of this chapter; no argument can convince me that it is. It is an extraordinary method of infection.

Transplant tubercular glands, scirrhous, epithelioma in bulk to any non-immune person and that person will probably become infected; such an experiment is of no value to determine the average every-day infection or non-infection of mankind with any of these diseases. The same remarks apply to the Keanu experiment, which was unique, extraordinary, but one way or the other could not possibly meet the issues that face us on the inoculation question.

In the face of all my own experiments, those of others, and my general knowledge of the cause of the spread of leprosy, I assert and claim, as I have done previously at the beginning of this chapter, "*that leprosy cannot be inoculated in man or animals on any dermal surface by ordinary methods. I also assert that the chief cause of the spread of leprosy is not by inoculation.*"

There are fair indications that certain essential conditions are necessary for a successful invasion of man by the bacillus leprae.

Preliminary.—(a) Receptive System.

Preliminary.—(b) Mucous Surface.

Preliminary.—(c) Presence of a FERMENT at point of entrance to the Human System.

Preliminary.—(d) Presence of LEPROGEN in the tissues.

The bacillus leprae possibly possesses a certain inherent power to extract from the tissues of man a fermentogen, or a substance

which may be converted into a ferment, which enables it to exist and develop primarily.

This said ferment later causes the tissues to liberate LEPROGEN, a pabulum which MAN alone possesses; it is presumably absent from the tissues of animals, hence they are generally immune to infection with leprosy.

It has appeared to me for many years, that the secrets of the cause and production of leprosy in the human system cannot be revealed through hemal investigation, on which workers have spent years and years of study without results, which ought to convince them of the fruitlessness of continuing along these lines, in attempting to prove leprosy as a disease carried in the blood, hence inoculable. A greater prospect of success lies along other paths, which I advocate, to wit: the secretions and fluids of the alimentary canal.

I am in possession of certain data bearing on alleged inoculation, but utterly irrelevant and immaterial to the subject, these data I have gained during my many years of investigation. Some of the facts, so-called, are startling, but in a book of this nature, intended for the general reader, are unprintable without shocking public morals.

* * *

To end this chapter I repeat the very significant fact that *fresh areas of infection cannot be produced in the incipient leper*, nor when the case is advanced. Fresh areas of infection can be started in the syphilitic, in the primary and secondary stages of the disease, by inoculation, and also in tuberculosis in animals.

I have made over one hundred attempts to inoculate new areas of the disease, in LEPROSY, in mild cases of the nodular form, and never once succeeded. Absolute proof of the inoculability of the disease has yet to be demonstrated.

CHAPTER IV.

IMMUNITY

Immunity, the condition of being immune, is security against any particular disease, and differs from susceptibility to the extent only of being less susceptible.

The various conditions of immunity are as follows:

1. Natural Immunity, the immunity with which any person is born.

2. Acquired immunity can be acquired in various ways.

3. Active Immunity, conferred after recovery from an infectious disease, such as measles, small-pox, scarlet fever; one attack is usually preventive of a second.

4. Actual Immunity is conferred after an attack and recovery from a contagious disease.

5. Immunity by Inoculation, successful inoculation of vaccinal virus as a protective against small-pox, a non-permanent immunity, requires a repetition of the operation after a varying lapse of years.

6. Passive Immunity, inoculation with an antitoxin or an attenuated virus. It yields the same results as when the bacteria themselves are used.

7. Inherited Immunity. The foetus in utero receives an immunity from the mother, being subject to the same disease which infected that parent.

8. Racial Immunity. Natural immunity possessed by race or group of people.

It is questionable whether actual immunity recovery after an attack of contagious disease, could not be applied to the abortive changes in nerve leprosy, the disease ceasing to become active; this conservative action is without doubt due to some toxin liberated in the tissues of the body which heads off, starves, or kills the bacillus leprae.

Susceptibility to disease is present in all cases, varies amongst different races of men.

Race susceptibility consists of three forms: natural, acquired, and inherited; it is very doubtful if any of these conditions are applicable to leprosy.

BACTERIAL INFECTION

The infective agent must be possessed of pathogenic properties, such as the status of the bacillus leprae to man, but not to animals.

In man the parasitic bacteria cause disease, and generate toxic products in the system called toxins. Each toxin must accumulate a certain degree of strength and quantity in the system, and the amount of toxin that each individual will succumb to, varies according to his resisting powers, be they great or small.

The incubative period of any disease is determined as to its length or brevity, by the presence in the system of a certain definite amount of its toxin, in order to sustain it and enable it to do effective work.

The bacilli of leprosy locally cause mechanical obstruction in the blood vessels, and gradually bring about breaking down and destruction of tissues. During the recurrent attacks of leprosy fever the infective toxin enters the blood, and is the cause of the various phenomena which ensue during the course of the fever.

This toxin seems to be excreted by the bacilli, in order to aid them to overcome certain opposing conditions in the system of the leper.

MOST PERSONS ARE IMMUNE TO LEPROSY

From the strikingly visible evidence put before us in Hawaii, it is absolutely safe to conclude that most people are immune to leprosy, save the Hawaiian, who is essentially lacking, but the remnant of the race is becoming more immune every day.

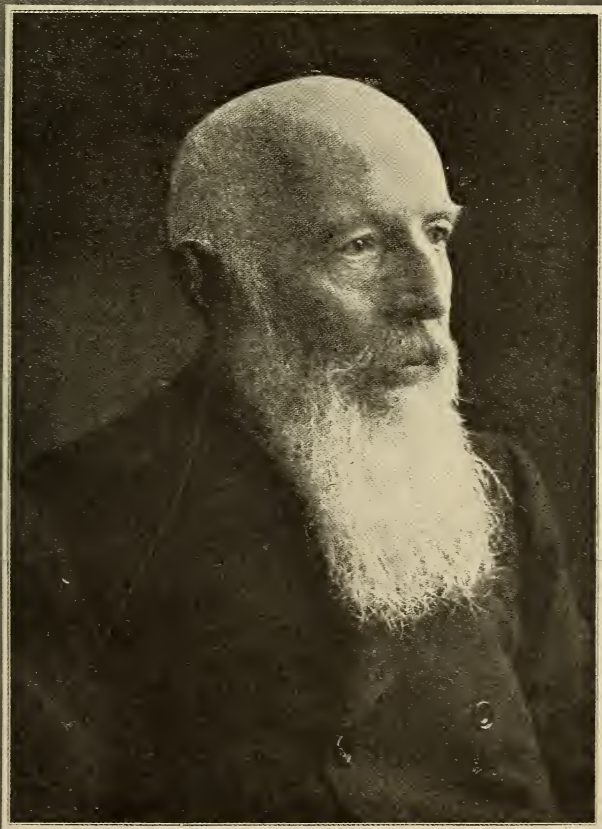
During the years 1888 to 1902, segregation was at its maximum, and the prevalence of leprosy amongst the Hawaiian people amounted to almost 4% of the population. Due to increasing immunity, continuous and more effective segregation, the percentage of leprosy for the year 1915 has fallen to 1¾%.

LUX IN TENEBRIS

It is quite a lengthy period of years from the quaint and crude description furnished us by Atreya of the Kushta, leprosy, 2000 B. C., to the late sixties of the nineteenth century, when Dr. Gerhard Armauer Hansen, Norwegian physician, working with indomitable courage, under most adverse conditions, was able to drag from the shades of darkness and demonstrate to the world, "that the tissues of the leper contained a microscopic vegetable parasite, in form a bacillus," which bears the name today of bacillus leprae of Hansen.

Dr. Hansen was born in the year 1841, and died in 1912.

Dr. Albert Neisser of Breslau, Germany, further investigated Hansen's Bacillus, and with improved methods of staining, and the



G. A. Hansen

DR. GERHARD ARMAUER HANSEN, OF BERGEN, NORWAY.

He discovered the Bacillus of Leprosy, A. D. 1868,
in the twenty-seventh year of his age.

* * *

Born 1841. Died 1912.

oil immersion microscopic lens, was able to corroborate Hansen's discovery, and the presence of the bacillus always in that form, absence of spores, and its non-motile character. Today, with bacteriology, founded on a firm basis, improvement in staining methods and microscopic construction, it can be truly said, "we have got the bacillus leprae, or leper flea popularly called," and it rarely escapes being found in the tissues and secretions of the leper.

Dr. Hansen had the advantage of having a vast field of leprosy to work amongst in the leper hospitals in and around Bergen, Norway.

The veteran leprologists Dr. Daniel Cornelius Danielssen (1815-1894), and Dr. Carl Wilhelm Boeck (1808-1875), were his coadjutors.

About the year 1868, Hansen found the leper bacillus, continuous investigation always gave him the same results, and in the year 1872 he showed his specimens to other bacteriologists; these, working independently, reached the same conclusion as Hansen, finding the bacillus always present in leper tissues.

Some forty years ago, 1874, the bacillus leprae was unanimously accepted as being peculiar to leprosy; it was invariably found in various tissues of the confirmed leper. The genius of Hansen made plain a subject upon which absolutely nothing was known, and which had been an enigma to physicians and philosophers for more or less 5,000 years.

In Biblical times, from the Book of Leviticus, we learn nothing of the cause or treatment of true leprosy, and so on to the beginning of the Christian era.

From about 25 A. D. to 33 A. D., the active years of the miraculous work of our Lord, lepers were cured, but nothing permanent was revealed to mankind. The cure of the disease and its cause remained as great a mystery as ever.

From the death of Christ, all through the early years of the subsequent Christian era, to the first thousand years after this event, history is silent on any discoveries about leprosy.

The disease was known, must have been latent, before spreading all over Europe in the middle centuries. Through all these years no advance in the scientific knowledge of the disease was made, until the persevering Hansen discovered the bacillus, and thereby threw the first beams of light on a subject hidden in the densest darkness for fifty centuries.

I have yet to learn if Dr. Hansen ever received any reward for his splendid discovery.

Even that great discoverer, the German physician, Dr. Robert

Koch (1843-1910), of bacillus tuberculosis fame, I believe also went without reward; he received no letters patent of royal titles, or grants of money or lands—prizes often handed out to civilians for various achievements not a fraction of the value to humanity compared with the work of these two scientific physicians, whose discoveries have benefited all peoples at no cost to any government or the public.

The years of tedious work necessary to reach the climax of the discovery of these two bacilli, lepra and tuberculosis, were given freely and voluntarily for the good of all PEOPLES, by both Dr. Hansen and Dr. Koch; their reward, except for the fame and publicity accruing to them, must come in the "Hereafter."

HANSEN'S BACILLUS LEPRÆ

In Hawaii this bacillus shows some slight modification from the European and Indian forms.

The bacillus lepræ is smaller, shorter and much more slender than its ally the bacillus tuberculosis, which it much resembles; it is apparently immotile, has pointed or clubbed ends.

The average measurements of forty specimens of bacilli, was 3 m. (microns or micro-millimeters) in length and .4 m. (microns) in width; these specimens were taken from forty lepers, eighteen to thirty years of age, of good development, and a medium progress of the disease had been reached. A micron equals $\frac{1}{25000}$ of an inch. The bacillus lepræ is easily stained by Fuchsin and Gram's solution; it is also more easily decolorized by the acid and alcohol washings used in the staining process, than the bacillus tuberculosis.

The bacillus lepræ in Hawaii differs from the Indian specimens in the thickness of the cell wall, and the diameter is also greater. The granular contents of the cell are more pronounced, and these class of bacilli are in a large majority; the homogeneous appearance of the cell contents is very indistinct, the staining of these contents is more difficult.

The presence of spores and flagellæ is negative; there is generally a preponderance in the microscopic field of the granular or old type of bacilli, as they might be termed. The homogenous bacilli are not largely represented; they are possibly young bacilli or those of recent development.

The ordinary Fuchsin stain does not show up the bacillus in Hawaii as it does in the Indian and European varieties. Other observers have noted this; there is a blurred appearance, due prob-

ably to a higher albumin content of the cell wall, which prevents and lessens the permeability of the stain.

Bacteria multiply and increase through segmentation or fission; the type of bacteria called bacilli elongates, usually about its center, the cell wall becomes puckered or indented, gradually a septum or division is thrown across the width of the cell connecting its opposite walls; this septum divides the cell into two parts, forming each a separate cell or parent, successive divisions later taking place. The new cells may exist separately or form part of a group.

In order to protect their contents, the cell walls of bacteria are generally remarkably resistant and tenacious. They resist physical and chemical destruction in a remarkable manner, and many spores and bacteria resist a temperature of the boiling point, 212° Fahr., for hours before they succumb.

The bacillus leprae seems not to possess intense resisting powers, all evidence tending to prove that it is of feeble vitality, and is easily rendered inert and sterile by changes of temperature and unsuitable location, and cannot thrive and flourish under the conditions which enable the bacillus tuberculosis to exist.

THE BACILLUS OF LEPROSY

Organs, tissues, secretions, etc., where bacilli are FOUND, although there are many variations in its presence.

Liver.	Jejunum mucosae.	Spinal cord.
Spleen.	Ileum mucosae.	Saliva.
Lungs.	Colon mucosae.	Nasal secretion.
Kidney.	Peyers patches.	Sputum.
Testicle, at times.	Solitary glands.	Faeces.
Ovary, at times.	Lymphatic glands.	Nodules.
Tonsils.	Sebaceous glands.	Milk, at times.
Salivary glands.	Skin, superficial layer.	Thermal blebs.
Sublingual glands.	Skin, deep layer.	Mouth ulcers.
Nerve sheaths.	Lymphatics.	Tongue ulcers.

BACILLUS NOT FOUND

Blood, except in leprous fever.	Placenta.
Urine.	Uterus.
Tears, variable.	Semen, variable.
Milk of nursing mother.	Sweat.
Menstrual blood.	Brain.
Lochia.	FOETUS.

Bacillaemia, the presence of the bacilli in the blood, occurs during the febrile attacks in leprosy.

The organs, tissues and secretions of two still-born children, both sets of parents being lepers, presented NO bacilli.

Leprosy is rare before the fifth year of age; the youngest case I know of occurred at three years and two months. The parents were not lepers, but the child was given to an aunt to bring up shortly after its birth. This woman was a leper, and the food of the infant was pap of sweet potato chewed and churned up in the mouth of the leprous aunt.

The lymphatics are permanent habitats of leprous bacilli, the thoracic duct contains almost invariably large numbers, and the mesenteric glands.

The blood is no permanent habitat of the bacillus leprae.

CHAPTER V.

CONTAGION, ETC.

The entire history of the spread of leprosy in Europe necessarily leads to the conclusion, that it must have been contagious on that continent, otherwise we are at a loss to explain the wide extent of the disease and its centuries of prevalence.

In the early years of the outbreak of leprosy in Europe, the housing, social customs, contact and many other conditions favorable for spreading the disease, resembled the situation prevailing in Hawaii until a decade or two ago.

Thirty years of experience with leprosy in the Hawaiian Islands has convinced me that they afford a strikingly rich, virgin field for observation and investigation.

The most promiscuous and freest commingling of the leper and the healthy has taken place, and the result attained has been, and is strikingly in evidence. *The number of lepers in former years was as high as four per cent amongst the aboriginal race, a higher rate than can be found amongst the people of any other country.*

The contagium of leprosy, that specific virus or material in which its infective power resides (the bacillus leprae) is mild, and has no such virulent properties as the contagium of tuberculosis (the bacillus tuberculosis). Did this high degree of contagion exist in leprosy the Hawaiian race would be doomed to speedy extinction.

The columns of my daily records, for any two years, show results almost identical in the three diseases I have selected, to approximate the relative degree of prevalence of each:

Tuberculosis	One hundred and ten cases.
Syphilis	Thirty-four cases.
Leprosy	Nineteen cases.

Prevalence of a disease affords some clue to its contagiousness, therefore,—Leprosy in prevalence and infective power would average 1 9-10. Syphilis in prevalence and infective power would average 3 2/5. Tuberculosis in prevalence and infective power would average 11.

For these approximate figures the Hawaiian race has been taken solely for comparison.

* * *

Leprosy is limitedly CONTAGIOUS to the CARELESS

contact with the disease, and is practically NON-CONTAGIOUS to the CAREFUL.

I have stated before, that in the conjugal relation the infection of the healthy consort even in tuberculosis is uncertain, and in leprosy is much more so.

Although Hawaii is, and has been an active center of endemic leprosy, the following figures show that a large majority of the Hawaiian race are free from the disease.

EIGHT CENSUS PERIODS HAWAIIANS.

1866	1872	1878	1884	1890	1896	1900	1910	Average
58,765	51,531	47,508	44,228	40,622	39,504	37,635	38,547	44,792
SEGREGATED LEPERS HAWAIIANS								
105	536	777	680	1,179	1,100	957	658	Total 5,992

Average number of lepers at each census period.....749

It has never been possible to segregate all the lepers. Numbers have hidden themselves, or have been concealed by their friends, many have died in the early stages of the disease from other complications. The following figures give a fair estimate of the number of lepers.

SEGREGATED

From the year 1866 to the year 1886—20 years.....	3,119
From the year 1886 to the year 1906—20 years.....	3,313
From the year 1906 to Jan. 1, 1915—9 years.....	785
	<hr/> 7,217

UNSEGREGATED

From the year 1835 to the year 1865—30 years.....	686
From the year 1866 to Jan. 1, 1910—44 years.....	1,793
	<hr/> 2,479

(Approximate estimate.) YEARLY AVERAGE, 33.50

Calculated on a $\frac{1}{2}$ of 1% basis of the population at census period, and deduced from continuous questioning of the inhabitants of all the large islands, and from my own personal travels and investigations during 28 years.

APPROXIMATE TOTAL OF ALL LEPERS..... 9,696

The records kept of segregation, both at Kalihi and the Leper Settlement, in the early periods of its enforcement, are very imperfect; as a matter of fact the Schooner "Warwick", and many other vessels, landed lepers from Maui and Hawaii direct at Kalaupapa, whose names were never entered on the books of the Settlement. I repeatedly discovered serious errors and discrepancies during the period of years between 1868 and 1877.

Shipments of lepers direct from Honolulu were duly entered, and tallied on the whole, with the books kept in Honolulu by the late Deputy Marshal Dayton, and the chief clerk of the Interior department, John Hassinger, also deceased.

The segregation of lepers has been irregular, spasmodic and efficient only at certain periods.

This is only too plainly evident in the testimony supplied by the yearly number of lepers segregated, as per following figures, which indicate activity and slackness, alternately; depending in the main on election or non-election years.

Year	Total Admissions
1866	141
1869	190
1870	57
1873	415
1876	75
1878	209
1880	51
1883	300
1886	43
1888	571
1889	307
1892	105
1893	209
1899	61

The efforts to stamp out leprosy by segregation have taken on the status of a political football, the party in power being assailed by the outs, who return the attack in kind.

Both political parties have been offenders, using the care and segregation of lepers as a target or a cudgel, depending on the state of the case.

The segregation law hits severely the Hawaiian race, the members of that race furnishing nearly all the lepers. I have stated before, the Hawaiians are in the main opposed to segregation and look at the enforcing of the law as a tyrannical act.

Money has the same power in Hawaii as elsewhere; position and influence also has its weight, and it has been alleged immunity from arrest and deportation to Molokai can be purchased, but no proofs of this allegation have been furnished.

The Hawaiians have the majority of votes, and to placate voters and gain their votes the enforcement of the segregation law has been purposely allowed to lapse temporarily; it is here where the advantages of Federal control would become manifest; then we would have efficient segregation; not as in the past, with leaks and weak spots glaringly in evidence.

All the reasons I have set forth above and in a previous chapter, will give ample information to the outside world why segregation of lepers has not made a better showing, and is my reply to the oft-asked question from various governments: Why does leprosy keep up its activity in the face of decades of segregation?

All of the foregoing statements and figures, although they may be open to criticism, should go far to convince any unprejudiced person that the Hawaiian people are far from being a race of lepers, as has been thoughtlessly and unjustly alleged by some, on a very superficial knowledge. The same aspersion on the status of the Hawaiian people in regard to the prevalence of syphilis has also been made. This is also unjust and untrue; my experience and that of many other physicians has been that syphilis affects the Hawaiians very mildly, and prevails in a moderate degree only.

The free and close intimacy maintained by the Hawaiian people in contact with lepers, and the resulting prevalence of leprosy, corroborates the statement of the late Dr. Tilbury Fox, famous expert on skin diseases:

"It is in those places where leprosy is on the increase that the freest intermingling of the leprous and non-leprous takes place."

Dr. McNamara's statement on the condition of the leper in India, shows a marked contrast to the attitude assumed in Hawaii towards the leper.

"Although lepers move about amongst their countrymen, they are isolated from them. Whoever saw a healthy native touch, much less eat, with one affected with leprosy?"

"In many parts of India, the fact of admitting a leper to a general hospital is sufficient to drive every other person out of it."

It is reasonable to suppose that a person, susceptible to leprosy, can re-infect himself every time he comes in contact with a leper. For example, eating three meals a day with him—such a case would also show more rapid progress than one not so frequently

infected; it also becomes apparent that we may be able to account for varied lengths of incubation by analyzing and studying occasional exposure to infection, and continuous and frequent exposure. Length of incubation is very deceptive in leprosy, owing to the complex and multiplicity of causes that may hasten or retard the progress of the disease.

Sooner or later the incipient leper gradually accumulates sufficient toxin in his system, the leprosy shows itself, and he himself is in a condition to infect other susceptible persons, and becomes an independent distributing focus of fresh infection.

LEPROSY IS NOT PATHOGENIC TO ANIMALS

Fortunately for the human race, leprosy is not a disease prevailing in the animal kingdom. If this disease had other allies external to man, it would be in a position to scourge mankind in a manner similar to tuberculosis.

* * *

If the sputum of the leper possessed the same infective property as that of the tuberculosis victim, also if leprosy existed in the animal kingdom, and hence aided the spread of that disease, it would not be an extreme inference to draw, that annihilation of the Hawaiian race would have come about ere this.

In Hawaii it would cause the most indifferent of us to shudder, to realize that our cows, horses, dogs, cats, chickens, pigs and our fish could become affected with leprosy. Such a state of affairs would be a most appalling calamity.

* * *

Providence has decreed that man alone shall be the host for the bacillus leprae, whilst tuberculosis is inflicted on both man and animals.

In and around the hospital enclosure at Kalawao, the various domestic animals acted as scavengers, consuming the debris and leavings of the kitchen and dining room and of the hospital wards.

The contents of the bedpans and chambers, owing to the absence of suitable toilets, were emptied around at some distance from the hospital buildings, resulting in a rank growth of grass which cattle and sheep fed on with impunity, the pigs and chickens eat the faeces, kitchen swill and refuse was consumed by the dogs and hogs. Left-off dressings and poultices of sweet potato, linseed, and bread, were also an addition to the diet of the scavenger animals and the cows.

No animal showed any ill effects from their morbid meals; on the contrary, they kept in prime condition.

Some of the dogs and pigs presented a mangy, hairless and scabby appearance with many cutaneous ulcers, but no true leprosy.

The so-called rat leprosy was never in evidence at Molokai.

The non-pathogenic infective property of leprosy to animals cuts off a formidable source of leprosy infection to man; hence, when the *last* leper becomes defunct, leprosy will disappear off our earth, because there will be no other suitable *host* remaining to nourish and keep alive the parasite, the bacillus leprae.

* * *

A significant axiom.—Any person, be he doctor, priest, nurse, attendant, or other, who ABSTAINS from taking ordinary care to protect himself from any known or suspected contagious disease, has no one but himself to blame if he falls a victim to a disease with which he is hourly, daily, weekly, and monthly in contact.

Postulate.—Any man who assumes without absolute irrefutable proof that leprosy is non-contagious is taking a dangerous position; and yet there are hundreds who do. Read the report on leprosy of the Royal College of Physicians, London, in the year 1867, who decided that leprosy was a non-communicable disease. I hold a diploma from that august body, yet I must differ from the findings set forth that leprosy is a non-contagious malady.

The communicability of leprosy again came prominently to the fore about the year 1890, chiefly owing to the world-wide advertising Hawaii obtained through the case of Fr. Damien.

Leprosy was claimed to be an imperial danger and a menace to the British Empire; an investigation was ordered. The Prince of Wales' commissioners visited India and made an exhaustive investigation, deciding that leprosy was not an imperial danger—that it spread "by ways and means unknown," also the general trend of the evidence obtained by this commission led them to conclude that leprosy was non-contagious and need not be segregated, a conclusion arrived at from the status of the disease in India.

Primary mouth infection diseases, like cholera and typhoid, from whence they enter the alimentary canal, will never infect a CAREFUL CONTACT, and I apply this same statement markedly to those who have intimate contact with the leper; but, unfortunately, this very condition of non-infection by leprosy of a careful contact, is used as an argument that the disease is non-contagious.

Now this pernicious assumption has lured hundreds of un-

fortunate people to their doom, and the disease continues its activity, and keeps spreading and spreading.

Previous to the year 1883, the question of nursing for the lepers had received no attention; it being quite impossible to obtain trained and faithful nurses in Hawaii, owing to the loathsome and repulsive nature of leprosy. Mr. W. M. Gibson, president of the Board of Health, in January of the above year, appealed to Bishop Herman, Bishop of Olba, head of the Catholic mission in Hawaii, to obtain Sisters of Charity from one of the many sisterhoods in the United States to come to Hawaii and help in the care of the leper women and girls.

Bishop Herman designated Father Leonore as agent to go on this mission, King Kalakaua giving him also a royal commission. After petitioning over fifty different religious sisterhoods, a favorable reply was given by the Franciscan Convent of Saint Anthony, at Syracuse, New York State.

Before acceding to the appeal for nurses for the lepers, the question was long and seriously debated in a solemn chapter of the Sisterhood, and finally twenty-four Sisters nobly volunteered their services. Of this number six were chosen, and accompanied by a Mother Superior, Sister Marianne, arrived at Honolulu November 8, 1883. Whilst there have been some changes through death and transfers, Mother Marianne is still alive, and others of the original band still survive.

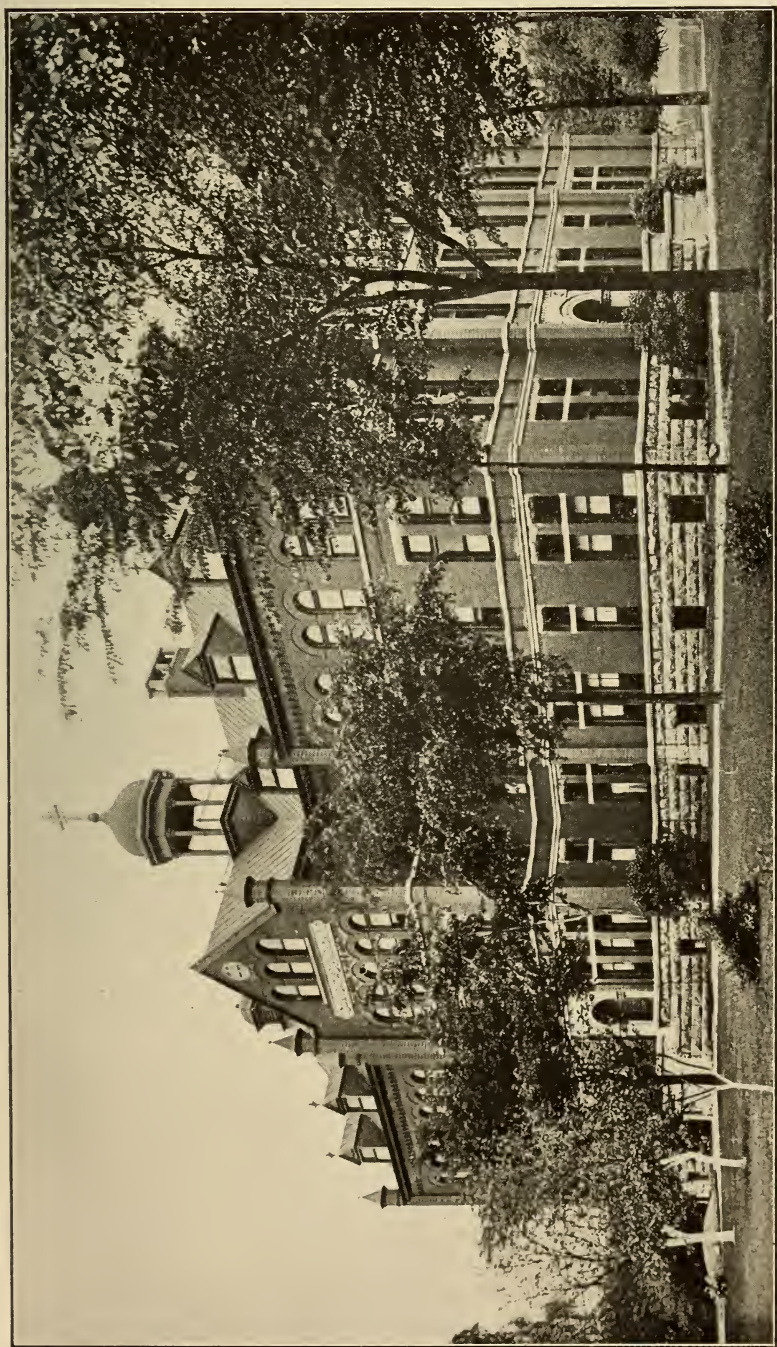
Five years were spent nursing and taking care of the sick lepers in the Kakaako hospital near Honolulu.

November 14, 1888, the Mother Superior and other Sisters transferred to Kalaupapa, and are now at the Bishop Home for women and girls.

For over THIRTY-TWO years these Sisters have been continuously in contact with leprosy in its most severe, loathsome, and repulsive conditions, and lo! NONE of them have become affected with the disease; hence the conclusion is drawn by many people that leprosy is non-contagious, whereas, the real solution and answer to the cause of the Sisters' immunity is their cleanliness and careful contact.

Washing and cleansing ulcers, wounds, and other duties of a nurse, are fearlessly and conscientiously performed hour after hour. When their duties are over, personal cleanliness is never forgotten, and contaminated hands are carefully cleaned.

Did you ever hear of a Sister eating with her leper charges? The answer is NEVER, and you never will.



CONVENT OF SAINT ANTHONY.

Headquarters of the Franciscan Sisterhood, Syracuse, N. Y.

All food and drink partaken of by members of the sisterhood is scrupulously clean, and not contaminated by leper contact or hands. All their cooking and laundry work is performed by non-leper servants.

Careful contact is the explanation of the cause of the freedom of the Sisters from leprosy, not the non-contagious character of the disease, and this statement applies to many other diseases besides leprosy.

Immunity may be falsely assumed as the cause of non-infection with a contagious disease, whereas the true explanation may be discovered in the extreme carefulness of contact or contactee with the disease.

Where there is so much difference of opinion on the contagiousness of leprosy, it is better to err on the safe side and accept the dicta of wisdom and experience, which indicates contagion—at least in Hawaii—and where also non-contagion is the ally of ignorance and inexperience. Because a prolonged and intimate contact with leprosy fails to infect in all cases, it is no good ground for concluding the disease is non-contagious.

The frequently made statement that So and So lived amongst leprosy for years and never contracted the disease, is simply a confession of ignorance of the lurking danger, and is equivalent to stating that many soldiers go into battle and never receive a wound, therefore there is no danger—this is only a partial truth.

There are numbers of houses in various parts of the islands where case after case of leprosy has developed amongst the inmates, father, mother, or children and grandchildren becoming lepers; these conditions all indicate that leprosy in clinging to a dwelling is truly A HOUSE DISEASE, and its presence can be explained on other grounds than heredity. In these houses frequent and continuous facilities by divers intimacies to acquire leprosy are ever present, and this is the daily routine. The disease is propagated or spread because it is contagious, not because of its hereditary tendency, and the intimate family association with the leper night and day is the foundation of the contagion in these leper houses.

A soldier on outpost duty is greatly exposed to danger; he knows his peril and is ever ready and alert.

A doctor, priest, nursing Brother or Sister at the Leper Settlement should know they are in the front rank of the danger line, and should be constantly on the alert and careful, and maintain a high standard of cleanliness, eating food not exposed to leprous contamination, admit no lepers to their rooms, have no leper cooks

or laundry work performed by lepers, and also maintain the highest standard of cleanliness of hands, teeth, clothes, and the whole person.

I assert anyone in contact with leprosy in its worst form (and living up to the standard of cleanliness I have outlined) need not have any fear of becoming infected with the disease, but let slovenly and uncleanly habits be the rule, then the risk is very much increased and no surprise need be expressed if the person pursuing uncleanly methods of living becomes a leper.

I claim there is very little risk of leprosy infection at the Settlement to careful persons; the danger is ever present and known; outside the confines of the Settlement leprosy infection is just as likely to occur, hidden foci of leprosy lurking outside where they are unexpected, like the highwayman hiding around the coroner.

I have knowledge of ONE Catholic priest who had leprosy, yet he never visited the Leper Settlement. I also know of two physicians who had leprosy, and neither of them had ever set foot on Molokai.

* * *

In a previous chapter, I have drawn special notice to the sublingual reservoir being the habitat of the bacillus leprae, the pocket formed by the inner surface of the cheeks and the inferior maxilla, is also a frequent situation where the bacillus leprae can be found, and I venture to assert that no external or visible signs of leprosy may be in evidence on the face, yet the bacillus may be lurking in the mouth, and in addition to what I have written in a previous chapter, it is quite within the bounds of possibility that many people may eat with and kiss a carrier of leprosy of this character without being aware of it. In this connection, I call to mind the solemn and pathetic declaration of two white women who became lepers: "Before God in Heaven we never saw a leper until we were taken to Kalihi; we cannot believe we have leprosy, we never slept in native houses." One of these women had never touched, and avoided, if possible, shaking hands with any Hawaiian; never had eaten poi, or had any close contact. The other woman was not so discreet, admitted having eaten poi, but had carefully cleansed her hands with soap and water before and after eating, admitted kissing Hawaiian girls and other female members of the household where she was a guest. Both these women had nodular leprosy and were addicted to using alcohol in excess.

There is this comfort for mankind. The bacillus leprae is a very feebly contagious parasite, a statement which any reflective and thinking layman in Hawaii can corroborate. Its contagion is far

from virulent, judging from the remarkably small number of foreigners affected with leprosy in Hawaii in the past fifty years.

When Fr. Damien fell a victim to leprosy and later succumbed to the disease, his semi-tragic death created a marked change and revulsion in the opinions previously held about the *non-contagiousness* of leprosy. A certain element of the British public became alarmed when they learnt of the case of Fr. Damien; rushed into print, and almost hysterically proclaimed leprosy to be an imperial danger and menace.

The London College of Physicians, who were the chief exponents and advocates of the non-contagiousness of leprosy, as stated in the declaration of their conclusions in the year 1867, began to hedge, and materially modified their opinion in the year 1887. Later on, in the year 1889, soon after Damien's death, the said college recanted, veered around, and admitted the contagiousness of leprosy.

Even Norway, a stronghold of non-contagion views, due to the teachings of Boeck, Danielssen, and Hansen (of bacillus leprae fame), began to switch, became converts to the views of the contagionists, and warmly advocated and supported them.

What caused this revulsion in the opinions of these famed Norwegian leprologists, Danielssen and Hansen? (Boeck having died in the year 1875.)

1. They had seen the beneficial check to the spread of leprosy in Norway by only partial segregation, even this had caused a marked diminution in the disease.

2. The rapid and continuous spread of leprosy in Hawaii.

3. The infection of Fr. Damien with leprosy.

If no other effect has been produced by the history of the life and death of Fr. Damien, it at least has wakened the medical profession from their lethargic state, and made them regard leprosy as a lurking danger to those in contact with it.

The general clinical view that we have of leprosy ought to convince us that it stands alone in a class by itself—its presumed length of incubation is remarkable, but some other pathogenic bacteria act the same.

Individual predisposition may or may not determine the contagiousness of leprosy, even in the face of the stereotyped general and vague remark that, "Whatever lowers the standard of health, must necessarily be a factor in inviting leprous infection." I cannot accept this statement in the face of the numbers of Hawaiian lepers I have known, who possessed a splendid physique, whereas puny

and ill-developed Hawaiians failed to contract the disease under similar conditions of exposure.

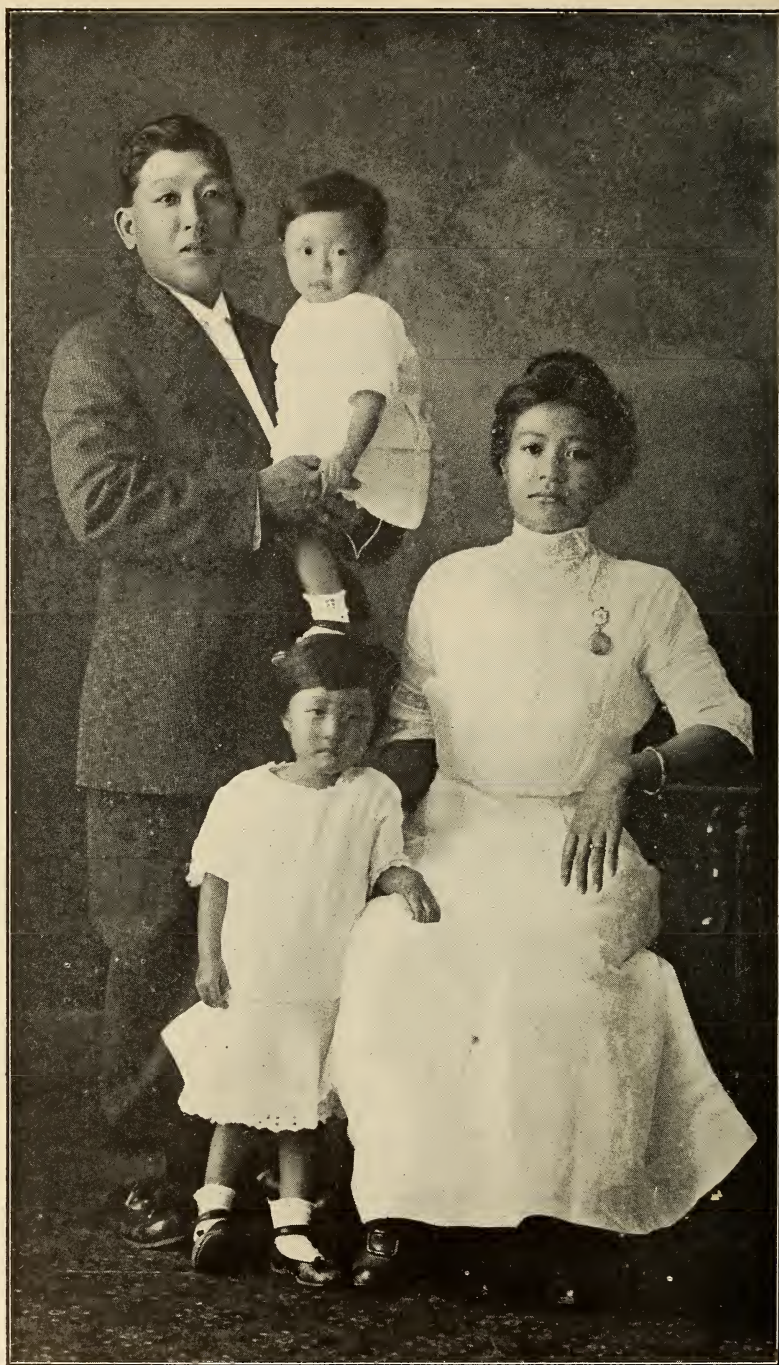
Apparently cured or aborted cases of leprosy may, and do, break into activity on fresh contact with the disease. There are good and valid reasons to believe that fresh seats of infection have been brought into activity.

In three cases of leprosy where the disease had remained quiescent for four, seven, and nine years respectively, and there was no contact during these periods of time with lepers, subsequent exposure and daily contact with nodular leprosy caused the disease to become active in the four-year case after ten months of contact; in the seven-year case after twenty-two months of contact; and in the nine-year case after seventeen months of contact, and in all, the disease remained permanently active and never again became quiescent, and finally killed these victims of secondary infection, or reinfection.

THE PROVED FACT THAT PROLONGED AND INTIMATE CONTACT WITH LEPERS SELDOM INFECTS PRIESTS, DOCTORS, NURSES OR OTHER CLOSE CONTACTS, IS STRONG EVIDENCE IN FAVOR OF THE LIMITED CONTAGIOUSNESS OF LEPROSY, IT ALSO POINTS TO THE ALIMENTARY CANAL AS THE RECIPIENT OF THE BACILLUS LEPRÆ; IF SYSTEMIC INFECTION TOOK PLACE BY THE BREATH, SPUTUM, NASAL DISCHARGE, INFECTED DUST AND OTHER LIKE AGENTS, THEN IT IS PLAIN THAT ALL THE ABOVE CONTACTS MUST ASSUREDLY SHOW A GREATER RATIO OF INFECTION.

The leper may reach the usual span of life, but such cases are few and far between in Hawaii, and are mainly comprised of the neural type. Mr. Ambrose Hutchison, whose history will be found in this book, has had the disease over forty-seven years.

Now comes the important point. During the long periods of latency and quiescence what is the bacillus lepræ doing? I claim it is dormant, and its capability of transfer and infection is very remote; the leper in this state is a carrier of leprosy of doubtful danger.



OUR RACIAL AMALGAM.

Japanese-Chinese-Hawaiian.

Father is Japanese-Hawaiian. Mother is Chinese-Hawaiian.

During these periods of inactivity some cases of the neural type of leprosy show no bacillus in the nasal and buccal secretions, a small minority do.

When as rarely happens, the nodular and mixed forms of leprosy take on lengthy periods of quiescence, the mucous membrane of the mouth will generally show continued activity of the disease in the form of tongue ulcers and erosions of the buccal mucosae, in the scrapings from these lesions, bacilli can be demonstrated.

Nasal discharge with ulceration of the septum nasi, may or may not have an important bearing on the question of contagion; many abortive or quiescent cases of leprosy continue to have nasal discharge, as practically the only active symptom of the presence of leprosy all their lives. The disease makes no progress, although bacilli are present in the nasal discharge; until further research demonstrates the contrary, I claim the bacilli are dead (cadaveric) and harmless. In one such case, this alleged active symptom of leprosy has continued for over thirty years, without any change in the general health and tissues of the body of the person so affected—a foreigner. These nasal aqueous discharge and mucous mostly contains bacilli, mutilated and of defective formation, and it is reasonable to assume that the blending of the acrid watery discharge and air contact, are the factors which render these bacilli cadaveric and harmless.

From the very nature of the source I regard the bacillus leprae in the mouth as formidable and to be dreaded; this I have discussed in previous pages. There are also strong reasons to assume that like its ally, the bacillus tuberculosis, the bacillus leprae is FACULTATIVE ANAEROBIC, it can exist and reproduce itself at a better advantage where there is NO oxygen.

Closing this chapter on contagion, I may reiterate.—Conjugal contact with syphilis generally infects the healthy consort; with tuberculosis infection does occur, but most of the healthy consorts escape. With leprosy, owing to its slow progress, there is more prolonged exposure to infection than in the average run of tuberculosis cases; yet in leprosy most of the healthy consorts also escape infection.

To conclude the subject.—*There is an ominous preponderance of evidence in Hawaii, all of which tends to prove and affirm the contagiousness of leprosy.*

HEREDITY

Post natal infection.—Most, if not all the cases of leprosy occurring in the children of leper parent or parents can be so explained.

Significant facts, tending to prove that leprosy is not hereditary through the leper mother, are the following: Absence of the bacillus leprae in the FOETUS, PLACENTA, and LOCHIA.

CHAPTER VI.

LEPROSY MORE PREVALENT IN THE MALE SEX

Leprosy prevails more frequently amongst the male sex, the ratio of infection compared with the female is about 2 to 1¼. Almost all the countries of the world show a preponderance of male lepers.

That it is not due to the large excess of males in the population is evident from the following figures taken from the last census, year 1910:

Race	Male	Female	Excess Male	Excess Female
Hawaiian.....	13,439	12,602	837	.....
Caucasian-Hawaiian	4,438	4,334	104	.....
Asiatic-Hawaiian.....	1,812	1,922	.....	110
Total.....	19,689	18,858	941	.....

Total Females..... 18,858

Excess of Males..... 831

The text-books on medicine inform us that males are more subject to nephritis, pneumonia, etc., because they are more exposed to the weather than females. When I was an immature medical student, I used to ponder over this statement and wonder how it could be proved, and concluded that exposure was a very remote cause indeed, unless the kidneys and lungs were damaged previously from some other more obvious cause.

Whilst the exact reason of the more frequent prevalence of leprosy amongst the male sex cannot in our present knowledge of that disease be determined to clearly meet all objections, nevertheless I will endeavor to show that the male is more exposed to contact with the disease than the female, and this phase or state of more exposure to infection may account in a certain measure for the greater prevalence of the disease in the male.

Many conditions prevail in Hawaii bearing on THE CAUSE OF EXCESS MALE LEPROSY that do not exist in other endemic leper countries. I do not feel competent to discuss this matter as it exists external to Hawaii, my statements alone apply to this latter country.

The Hawaiians are gregarious in their habits, and travel from place to place; any steady occupation is unsuitable to their tempera-

ment, they are pleasure loving, and any sustained effort of mind or body palls on them.

I speak of twenty years ago. The Hawaiian pursuing his daily labor away from his home never carried any dinner pail, but ate and slept in the house of some friend near to his work.

If the Hawaiian was a fisherman, just as often as not, after being several hours in the sea, he was perhaps miles from his home. He landed and slept at the nearest house.

If he went up into the mountains and became belated or benighted he sought a nearby house.

The cowboy miles away from his home at meal times, sought the nearest house for food and shelter.

Hospitality with the Hawaiians is or was a remarkable virtue; no stranger was ever refused food or shelter.

The female Hawaiian, while not a stay-at-home person, did no such traveling about from house to house, eating here and there. In former years, horses were cheap and numerous, the unfenced lands bordering the roads gave free pasture to horses whenever their riders rested. There was more traveling two decades ago than today, and greater facilities existed for frequent contact with unsegregated lepers.

The female Hawaiian generally remained at home except perhaps on Sundays, or bi-weekly visits perhaps were paid to the nearest store, sure to have a Chinese proprietor. If the woman wished for food, poi was rarely to be had, but bread, tea, cake, and pie; furthermore, the woman was not likely to have a leper companion during her meal—the Chinese avoid the leper. The food supplied was fresh and cooked, not promiscuously handled by any chance leper.

The male Hawaiian, on the other hand, in his travels may be said to have had invariably poi and fish for his meal, all his fellow-eaters using the same dish, and if there was a leper amongst them, the visiting Hawaiian would not avoid his company, but eat and drink and sleep with him just as likely as not.

The report of W. N. Armstrong, president of the Board of Health, to the Legislature, year 1882, states as follows:

"There are probably 2,000 lepers in the Kingdom or 5% of the whole native race. It is probable that as many more have the seeds of the disease."

Leading the life the native Hawaiian led at that time, restless, moving frequently from village to village, sleeping and eating when and where he saw fit, the probability of promiscuous contact with lepers would be a certainty, and the traveling Hawaiian



HAWAIIAN JAPANESE.

would take no steps to avoid contact with them; on the contrary, he would court their society, smoke their pipe, eat out of the same dish, sleep on the same mat and so forth.

The contact of the traveling Hawaiian with leprosy was not once, twice, or occasionally, it was continuous; the traveler would rest a week or two, then begin again, hence the prospect of infection was practically ever present.

Mr. W. N. Armstrong's statement about the number of lepers and possible lepers reaching a total of 5% of the population is not far from the truth, the subsequent years of segregation go to prove its correctness. "In said year 1882, 706 lepers were in segregation at Kalawao." Further on in his report Mr. Armstrong states, "there are 400 lepers in Kakaako and Honolulu City."

The hospital at Kakaako was a sham, segregation was in name, not fact, the leper and non-leper could kiss each other, smoke the same pipe, pass in food through the leper-proof fence (?). Now I except Honolulu on this more frequent exposure of the male to leper contact, in this city the sexes would have equal exposure and opportunity of contracting leprosy.

In the districts of the islands not closely adjacent to the larger villages and towns, poi is manufactured and kept for sale in some house or small store.

The taro patches contiguous to the homes of the Hawaiians were leased to some head man or Chinese, who manufactured the taro into poi, and from whom this article was purchased. To my own knowledge in ten instances, a leper worker was employed in these poi factories, one Chinese poi maker was a leper, two Caucasian-Hawaiians were lepers, and the remaining seven leper poi makers were of the Hawaiian race.

The residents residing *near* the poi shop sent a member of the family to obtain the family poi, and from close observation I observed it was generally a member of the male sex, very occasionally a grown girl, or young woman. If poi had to be obtained at some distance from the home, a mile or more, some male member of the family (grown up) was sent for it.

It is just by such evidence as this, furnished link by link, that a chain of more exposure of the male can be built up and the preponderance of the disease in that sex explained in part.

Again, let us suppose a young girl or a young woman has the leprosy, the disease makes no difference to the Hawaiian lover; he will visit and eat with her, and she may possibly infect him. The girl may tire of her lover, and another comes on the scene, she infects him, and the process goes on indefinitely.

I have a history of four cases where young women, Hawaiians, had leprosy, and where, owing to the arrival of a stepmother, the brothers and half-brothers were driven from the house; later on in the absence of the stepmother, clandestine visits were paid to these young women by their brothers and lovers. Of course they ate with them, the usual diet of poi and fish, and to be polite, the women in the case stirred up and freshened the poi (with unwashed hands), the usual proceeding.

The result later—*four brothers* of these girls or young women acquired leprosy, and two of the lovers.

It is not the penile inoculation that spreads the disease, it is the leprous contaminated food—poi, fish, or whatever else may have been handled by the leper, or that has direct contact with his mouth.

In promiscuous Hawaiian hospitality lurks hidden danger.

The preceeding remarks are an attempt to show that the male is more exposed to leper contact than the female, and may account in part for more male than female lepers.

I reiterate, the contagium of leprosy is so mild that it deceives many competent observers, and leads them to conclude that the disease cannot be spread by contact. They judge the infective properties of the leprous discharges by the high standard of tuberculosis infection.

In order to explain the low degree of contagium of the secretions and discharges from the leper, we must conclude that free contact with the air renders the bacilli inert, causes them to lose infective properties, and become cadaveric, all of which statements I have made under other headings.

In former years I held to the idea that menstruation was a factor to be reckoned with in lessening the receptive status of the female to leprosy, but I have retreated from that belief with my wider and longer experience with the disease.

At the present day my views are, in the light of more mature investigation, that the menstruating female and the non-menstruating are equally liable to leprosy.

I have known forty females, all over twenty-five years of age, who had never shed a drop of blood from the uterus, and not one was a leper, although ten of them had leper relatives.

Two conditions, in the role of the progress of leprosy in Hawaii, appear to have changed during the past twenty-five years:

A. The greater susceptibility of the male seems to be decreasing.

B. The period within which most cases of leprosy develop in the female is now between the ages of eighteen to thirty years.

NUMBER OF SEGREGATED LEPERS AT MOLOKAI,
JUNE 30, 1915.

Males	382
Females	256

Total	638
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Males approximately 60%, females 40%.

Over 81% of the lepers are Hawaiians and part-Hawaiians.

Hawaiians	522
Caucasians	61
Asiatics	55

Total	638
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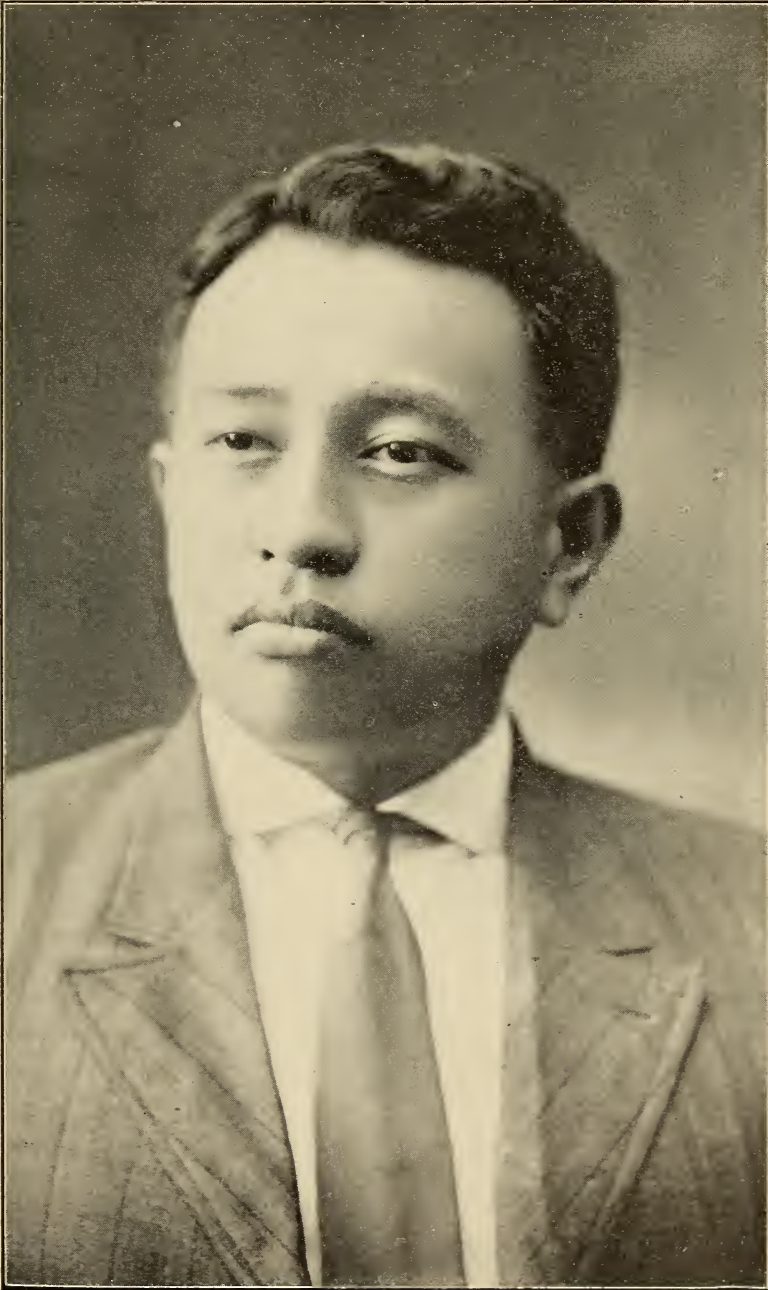
NATIONALITY

Hawaiians	416
Caucasian-Hawaiian)	106
Asiatic-Hawaiian)	
Chinese	32
Japanese	13
Korean	10
American	3
Belgian	1
German	6
Porto Rican	2
Portuguese	46
Russian	1
Spanish	2

Total	638
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ANNUAL TOTAL OF SEGREGATED LEPERS AT
MOLOKAI, AS OF JUNE 30th.

YEAR	NUMBER	DECREASE	INCREASE
1910	614	---	---
1911	595	19	---
1912	622	---	27
1913	683	---	61
1914	666	17	---
1915	638	28	---
		64	88
INCREASE		24	



ASIATIC-HAWAIIAN TYPE.
Chinese Father—Hawaiian Mother.

MISCELLANEOUS TOPICS PERTINENT TO LEPROSY

There is this significant evidence to indicate that the alimentary canal is the main location of the general systematic infection and entero-toxism that exists in the leper.

"THE SOLE REMEDIES THAT HAVE ANY BENEFICIAL EFFECT IN LEPROSY ARE GASTRO-INTESTINAL STIMULANTS AND DISINFECTANTS, WHOSE ACTIVE PRINCIPLE IS A TERPENE, ISOMERIC WITH OIL OF TURPENTINE."

The active principle of cashew, eucalyptus and gynocardia is a volatile oil somewhat complex in composition, a mixture of isomeric hydro-carbons (terpenes), all have the formula $C_{10} H_{16}$. All the above remedies will certainly retard the progress of leprosy, but there is no cure in sight.

Carbolic acid, iodoform, creosote, bismuth salicylate, naphthol, salol, thymol, sodium sulpho-carbolate, and sodium salicylate are gastro-intestinal antiseptics and disinfectants, but they all lack the stimulating principles of the volatile oils. Amongst these drugs sodium salicylate is the only one of any value, also magnesium salicylate, which should be pure (contain 85% of natural salicylic acid, not the artificial, and 15% of magnesium).

Pathogenic bacteria thrive best in alkaline media, hence the lactic acid producing Bulgarian bacillus is a valuable remedy in leprosy.

Attendants on lepers, who are exposed to continuous intimate contact should take salicylate of soda in one-gram doses twice daily, two days a week at intervals of three days. The salicylate is excreted in the saliva, and its presence can be detected for several days after taking; it has a powerful germicidal action against any bacilli which may inhabit the mouth; also, one day of each week, four grams of magnesium salicylate should be taken two hours after each meal.

PRIMARY AND SECONDARY PHYSIOLOGICAL EFFECTS OF THE VOLATILE OILS

Externally.—Stimulation of the skin, redness, tingling, even vesication.

Internally.—Stimulation of the gastro-intestinal tract, hence increase of vascularity, saliva, gastric juice, and fluids of the intestine, and excitation of the unstriped muscular fibres.

In average doses the volatile oils are stomachic and carmini-

tive, in large doses they assume irritant properties. The stimulation of the stomach accelerates the heart and central nervous ganglia, skin secretion and mucous membrane of the bronchi. Excreted by the kidneys, they irritate and stimulate (hence are diuretics), and the genito-urinary tract is also acted on in like manner.

Eucalyptus oil is powerfully antiseptic and disinfectant. In medicinal doses it stimulates the heart reflexly through its action on the stomach; it imparts its odor to the breath, disinfects the urine and faeces, acts on the skin as a diaphoretic, on the bronchi as an expectorant, on the kidneys as a diuretic, and stimulates the mucous membrane of the bladder. Much increase in the dose, over five minims, irritates the stomach, causing vomiting, diarrhoea and pain, slows the heart and lowers the temperature, depresses the nervous centers and may cause hæmaturia.

The therapeutic action of eucalyptus and gynocardia or chaulmoogra oils are almost identical, the latter causes more stomach irritation, and hence is more nauseating.

It is possible to explain the reasons why the use of gastrointestinal stimulants and disinfectants fail to effect a more effective and permanent benefit in leprosy, based on the theory that *intestinal antiseptics destroy or diminish the benign and protective bacteria which exist in the intestinal tract under normal conditions*, while the volatile oils are destructive to the bacillus leprae and its toxins, they also destroy and eliminate the various bacteria, which are helpful and assist the normal intestinal functions.

POSSIBLE EXPLANATION OF THE THREE FORMS OF LEPROSY—NODULAR, MIXED, NEURAL

When several members of a family are affected with leprosy, the same type is present in all—nodular in all, or neural in all. Why the nodular type should specially select the skin and mucous membranes, and the neural type have predilection for the nerves and sheaths cannot be definitely determined from our present knowledge of the disease.

Undoubtedly the primary form of leprosy is nodular, then comes the intermediate, the mixed form, possessing features common to the nodular and neural forms, and lastly comes the neural form.

Possibly each receptive individual has some peculiar condition of the system that determines his type of leprosy, hence the members of his family will all have the same type following that of the parent.

It is conceivable that the bacillus leprae in its initial entry into the system has a **FIXED INSTINCT OF LOCATION** definitely determined, which leads to the bacilli seeking the skin and mucous membranes and locating there, causing the phenomena and appearance of the disease which we name nodular or tubercular leprosy.

This form of the disease is the usual and most prevalent type, and the cause of the change, modification, or deviation therefrom must be sought for in some idiosyncrasy of the body tissues and secretions. It is reasonable to assume nodular leprosy can be changed to neural leprosy under this theory, and also this metamorphosis must take place in the early stages of the bacillary life in the human system.

It is reasonable to assume (which alone is possible in our present limited knowledge of the true condition), that some member of the pathogenic bacteria of the intestinal tract may be responsible for this change of **INSTINCT OF LOCATION**, which determines and decides the selection of the bacillus leprae for the nerves and nerve sheaths.

The change must be made before the bacillus seeks its home by means of haemal and lymphatic circulation, and the bacillus aerogenes capsulatus, present in excess in cases of marked intestinal putrefaction, may be a possible factor; polyneuritis and muscular atrophy are commonly associated with the presence of this bacillus.

If this bacillus can have an augmenting influence in cases of intestinal derangement, and aid morbid lesions in the nerves, both central and peripheral, it is reasonable to conceive that the bacillus leprae arriving on the scene may have its *instinct of location* moulded and changed by the paramount influence of the *B. aerogenes capsulatus*, and the bacillus leprae, instead of locating in the skin and mucous membranes, locates in nerve and nerve tissues.

ALCOHOL IN LEPROSY

The injurious effects of excessive use of alcohol upon the system are only too well known to the pathologist, and even to the educated layman.

An agent that causes grave changes in the structure of the arteries and nerves cannot be looked at askance with leprosy lurking around.

The identical morbid changes that leprosy, by the aid of its bacillus, produces, to wit.: peripheral neuritis, arteritis with arterio-capillary fibrosis, etc., is also produced by the abuse of alcohol in its various forms and grades; quite apart from its irritant and

poisonous effects on the other portions of the human system, alcohol cannot be looked on in any other light than a faithful ally of leprosy.

From an experience of over three decades, I can assert without fear of contradiction *that the deluded creatures who are in the clutches of alcohol, drinking to excess when in contact with leprosy, are much more liable to contract the disease than those who use alcohol moderately or do not use it at all.* This statement is also applicable to tuberculosis.

Every word that the late Dr. Brinckerhoff used in his able and classical thesis on the connection of ALCOHOL and LEPROSY I endorse, and also his clear and incisive conclusions on the subject matter of his thesis.

The abuse of alcohol in Hawaii by a certain race cannot be viewed by any thoughtful person, save with mingled feelings of sorrow and dismay.

The rapid decimation of this race is markedly due to the excessive use of alcohol. It not only destroys the present members of the race, but also the coming ones. Healthy and sturdy children cannot be begotten by drunken parents.

The ravages in the system of man induced by the ABUSE of alcohol are due to:

1. Its direct irritant action.
2. Its deleterious influence on the vaso-motor nerves, which control the expansion and contraction of the walls of the blood vessels.
3. Organic visceral lesions and degenerative changes. In the stomach, congestion, chronic catarrh, fibroid and glandular degeneration. Atrophy of various organs, tissues, and nerve centers. In advanced "tipplers," grave nervous lesions as absolute dementia, peripheral neuritis, extreme muscular trembling and weakness, paralysis or ataxia, epileptiform attacks, finally coma.
4. The decomposition and entrance into the circulation of the poisonous elements of the alcohol.
5. Interference with tissue—metamorphosis, oxygenation and nutrition.

It seems unnecessary to state that the stronger alcohols, rum, whiskey, brandy, and gin, taken repeatedly and undiluted on an empty stomach, are among the most insidious habit-forming and destroying agencies of the human race on our planet; also their presence and continued abuse is one of the greatest blots, menaces, degradations, and disgraces of our much vaunted civilization of the twentieth century.

As long as our so-called paternal government degrades itself and stoops to license the drink trade, just so long will its victims and dupes swell the ranks of maniacs, degenerates, consumptives, and lepers.

In alcoholic peripheral neuritis trophic changes occur in the nails, skin, muscles, due to defective nerve function; the symptoms are milder than in the infective neuritis of neural leprosy.

Peripheral alcoholic neuritis is certainly a first cousin to leprous neuritis.

I am strongly of opinion that the disease called syringomyelia (abnormal cavities or spaces in the substance of the spinal cord), as described by Drs. Jean Martin Charcot of Paris, and Moritz Schiff of Germany, is neural leprosy, modified by the effects of alcohol, and this disease may be transmitted from parent to offspring.

The peculiar disease met with in Brittany described by Dr. Morvan, and bearing his name, carries all the earmarks of nerve leprosy complicated with alcoholic neuritis.

Briefly stated, the history of alcohol and disease in Hawaii is as follows:

From July 1, 1908, to June 30, 1914, a six-year period, amongst the Hawaiian race 5,835 deaths were registered, an average annual mortality of 972 and a fraction over, about 27 per mille or thousand. The death rate of continental U. S. is some 18 per mille; about 10% of the deaths are caused directly and indirectly by alcohol.

The Hawaiian death rate is 33% more per mille—computing on a 14% basis gives 136 deaths due to alcohol, out of the annual death rate of 972.

These 136 deaths represent an annual toll levied directly by alcohol on our weaker brothers and sisters, who cannot resist the temptation, drink to excess, and are sacrificed on the altar of the alcohol god.

ARTIFICIAL LEPROSY

I have failed to inoculate by skin abrasion, rabbits, cats, rats, guinea-pigs, and in one instance a mongoose (a fierce and untamable animal), this also being the experience of many other workers in the same field. I will briefly describe the method and results obtained.

Whenever I had a supply of leper blister serum, I inoculated the above animals in pairs, except the mongoose, one experience with this animal was enough. I chose the inside of the ear for

the seat of inoculation, because the animal cannot lick the wound, using antiseptic measures, scarifying a surface about the size of a ten-cent piece, rubbing in the blister serum similar to the operation of vaccination.

All these experiments failed to produce any leprous infection.

I continued the experiments for several months with no success, then, chiefly due to lack of assistance and proper care of the animals, some died, others escaped from the pen. I had remaining one rabbit, two guinea-pigs and one cat, and in the tenth month from the date of their first inoculation, I killed them, the resulting examination by the naked eye and the microscope, gave no signs of leprous infection.

In the summer of the year 1885, I examined a monkey Dr. Arning had inoculated (with blood serum and the juice from a leproma), some ten months after inoculation had taken place; at that time nor subsequently did any systemic leprous infection occur. The next year the doctor left Hawaii and returned to Germany, but I learnt afterwards that the monkey had died never showing any signs of leprosy.

Some twelve years elapsed, and, being firmly convinced of the improbability of reaching any results from dermal inoculation, I decided to try to obtain leprous infection through the mouth and alimentary canal and peritoneum.

I was able to obtain a limited supply of leprous blister serum from the burns due to thermal anaesthesia, and when this supply failed me, I resorted to cantharides collodion. In our winter, so-called, when the temperature does not exceed 23° Cent., this blister serum can be kept several weeks, a solution of boric acid in glycerine being added, otherwise decomposition occurs.

Using the same serum by intra-peritoneal injection in a guinea-pig, and injecting 2c.c. once a month for four months, no signs of leprosy showed up to the tenth month, when the animal died from dysentery.

Six animals, two cats, two rabbits and two white rats, were given three times a week for two months 1 c.c. of leprous blister serum in milk per os, the gastric juice being previously alkalinized by the administration of 2 c.c. of liquor potassae. In the third month the rabbits and one cat died. In the fourth month one of the rats died, and on examination, the mesenteric glands and liver showed traces of leprous infection, the bacillus leprae being present. The exact cause of death I could not determine.

At this time, the end of the fourth month, the surviving cat and rat appeared apparently healthy.

Bearing in mind the excessive use of salt by many Hawaiians and its effect on the gastric juice (all of which I have discussed in previous pages), led me to imitate as far as possible the temporary alkalization of the gastric juice with liquor potassa, far more powerful and speedy in effect than sodium bicarbonate, but this changing of the gastric juice from acid to alkali inhibits or stops pancreatic secretion, which I consider aids, and is a necessary adjunct to favorable development of the bacillus leprae.

I added therefore to the milk fed to the cat and rat small quantities of fresh pancreatic juice, expressed from the pancreas of the pig, when I could obtain it, as well as the leper blister serum.

When I had no supply of fresh pancreatic juice, I used ten grains of the white powder, extract of the pancreas or TRYPSIN.

At the beginning of the seventh month from the commencement of these feeding experiments, the rat showed considerable emaciation, loss of hair giving it a mangy appearance, a few small papules developed in the skin of the chest, sides of the abdomen, and inner surface of the thighs, the free edge of the ears showed decided infiltration.

These signs of undoubted leprous infection made slow progress, but owing to the rapid emaciation, I gave no more leprous blister serum, changed the rat's food to finely chopped meat, cheese, chopped egg, cracker, all to no effect, the animal succumbed the middle of the tenth month to leprous dysentery. Examination of the body and organs revealed leproid deposits in the liver, spleen, mesenteric glands, and mucosae of the ileum, with ulceration extending into the colon and rectum.

Sections revealed bacillus leprae in large numbers.

Owing to lack of time, proper quarters and facilities for carrying on further work, and having to change my residence, I killed the cat, a young male, which showed leproid deposit and infiltration of the flanks, muscular wasting, skin atrophy, and considerable alopecia of the cheeks and forehead and abdomen, all the internal organs and intestines were healthy except the liver, which revealed leproid nodules yielding bacilli. They could also be detected in the leproid skin infiltrations.

* * *

I spent nearly five years in the aggregate experimenting; met with poor success, but I gained experience.

Cultures I never attempted, due to lack of time and skilled assistance.

EPILOGUE

In the Preface of this book I have given certain reasons, stating how I came to write it; I now add further supplemental causes which influenced me to come forward and make public my views and experiences with leprosy.

In the year 1909, Mr. Joseph Dutton, the venerable manager of the Baldwin Home at Kalawao, whom I met in the year 1886 (when he first arrived at the Leper Settlement to take up his work amongst the lepers), wrote to me and asked me to write my experiences with leprosy. I gave him a negative answer.

In the month of March, 1912, I received a letter from Mr. E. A. Mott-Smith, who filled the dual offices of secretary of the Territory of Hawaii, and president of the Board of Health, asking me to supply him with certain information on leprosy, also advising me to go on with my leprosy investigation and write up the subject. I hesitated.

I may add Mr. Mott-Smith was a most genial and tactful president of the Board of Health; his education in law materially aiding him. He is also a great authority on leprosy and its prevalence.

I believed at this time that other workers in the field of leprosy, of more modern education, were better outfitted and could do better work than I could.

During the latter years of the late Father Wendelin's life, he often spoke on the subject of leprosy and its collateral bearings, and urged me to publish my notes and work on that disease.

On the last day of April, 1914, when the priest's death appeared imminent to himself and his physicians, he desired me to promise to write my views and knowledge of leprosy for publication, especially he besought me to give my views on Father Damien's case, and also to write all I knew of his life, whether it was favorable or unfavorable to his reputation.

I assured Father Wendelin that if anyone could influence me to act as he desired, he himself could. After due reflection and mature consideration, I condensed and put in writing the material which is spread on the pages of this book.

END OF PART TWO

GLOSSARY

Alii, Chief, Prince, Leader.

Alopecia, Baldness.

Anaesthesia, Loss of sensation.

Anamnesis, Past history, memory.

Anginal, Suffocative Spasms.

Arterio Capillary Fibrosis, Thickening, narrowing of small arteries.

Ataxia, Irregular Muscular action.

Atrophy, Wasting.

Axilla, Armpit.

Bacillemia, Bacilli in the Blood.

Bacilligenic, Caused by a Bacillus.

Bacillus, A little stick, rod or pencil, a genus of micro-organisms.

Bubo, An inflamed gland.

Buccal, Pertaining to the mouth or cheek.

Cadaver, A corpse.

Caries, Ulceration of bone.

Carpus, Bones of the wrist.

Chancre, A venereal sore.

Colon, The large intestine.

Cystitis, Inflammation of the Bladder.

De novo, Anew.

Duct, Thoracic, A small canal, carries Lymph; in back of the chest.

Duodenum, A portion of the small intestine.

Ectropion, Eversion of the edge of the eyelid.

Elephantiasis, Elephant-like, Leprosy.

Endemic, Peculiar to a people or locality.

Entero-toxism, Poison generated in the bowels by toxins.

Femoral, Relating to the thigh.

Fibroid, Resembling fibers or bands.

Flagellate, Whip-like.

Focus, Plural Foci, central point or points.

Gland (an acorn), A small or large fleshy mass or organ.

Gonorrhoea, A contagious discharge from the genitals.

Gumma, Soft gum-like nodules of Tertiary Syphilis.

Gynaecological, Pertaining to diseases of women.

Haole, Foreigner.

Hawaii nei, Greater Hawaii, all the islands of the group.

Haustorium, A drawer or sucker, blood sucker apparatus of the mosquito.

Helix, Rim of the Ear.

Homogeneous, Like, of the same kind.

Horripilation, Rough skin, goose skin, erection of the hairs.

Hydrochloric Acid, HCl.

Idiosyncrasy, Peculiarity.

Ileum, Distal portion of the small intestine.

Impetigo, A skin disease, isolated pustules or boils.
Infective Neuritis, Inflammation of a nerve due to presence of bacteria.
Indigenous, Native or native born.
Inguinal, Relating to the groin.

Jejunum, A certain part of the small intestine.

Kai or Makai, Towards the sea.
Kamaaina, An old resident, a child of the land.
Kane (k), Man or male.
Kauka, Doctor.
Kokua, Assistant or helper.

Lepraphobia, Fear of Leprosy.
Leptogen, Food or Pabulum of the *Bacillus Leprae*.
Leptoid, Like Leprosy.
Leprologist, Expert on Leprosy.
Leproma, Leprous Tumor or Nodule.
Litmus Paper, Blue and red, it indicates alkalies and acids.
Lochia, Uterine discharge after child-birth.
Lichen Ruber, Skin disease, scales and small lumps or papules.
Locomotor Ataxia, A disease of the spinal cord.
Lux in Tenebris, Light in the Darkness.
Lysins, Bacteria Destroyers.

Ma'i, Sickness.
Metacarpus, The bones of the back of the hand.
Metatarsus, The bones between the instep and the toes.
Mono, Single, limited to one.
Moron, Feeble-minded, not an imbecile or idiot.

Nanism, Dwarfed, ill developed.
Necrosis, Death of Bone, or Soft parts.
Nephritis, Inflammation of the kidneys.
Neural, Pertaining to the nerves.
Neuritis, Inflammation of a nerve or nerves.
Nodular, Node, swelling or lump.

Osteomyelitis, Inflammation of a bone and the marrow.
Ostracism, Banishment from Society.
Ovary, Female sexual Gland.

Pabulum, Food.
Pake, Chinese.
Pali, Precipice.
Pathogenic, Disease producing.
Pathognomonic, Pointing out a Disease.
Pectoral, Relating to the chest.
Peripheral, Distant from the center.
Peritoneum, Serous lining of the abdominal walls.
Peritonitis, Inflammation of the peritoneum.
Peyer's Patches, Lymph glands in the small intestine.
Pilikia, Trouble in any form, or cause, etc.
Pityriasis, A skin disease, branny scales.

Placenta, A flat cake, the after-birth.

Pneumococcus, A globular or spherical micro-organism.

Poi, An edible paste made from Taro, Bread Fruit, etc.

Popolo, A Hawaiian medicine used for cough, stomach and eye diseases, etc.

Prodromal, Approach of a disease.

Psoriasis, Scaly skin disease.

Psoriatic, Like psoriasis.

Pulmonary, Connected with the lungs.

Pylorus, The opening to the bowel end of the stomach.

Pyæmia, Blood poisoning.

Recrudescence, Recurrence.

Rupia, A skin disease, blisters and scabs.

Sclerosis, Hardening.

Solitary Glands, Lymph glands in the small intestine.

Spore, Reproductive element of lower Organisms.

Sporogenous, Reproduced by Spores.

Sputum, Matter ejected or spat out.

Subclavian, Under collar bone.

Syphilis, A contagious venereal disease.

Tachycardia, Rapid action of the heart.

Tarsus, The bones of the instep.

Telluric, Connected with the Earth.

Thenars, The muscles of the ball of the thumb.

Thrombosis, A plug or clot forming in a blood vessel.

Tinea Versicolor, Yellowish patches on the skin due to a fungus.

Traumatic, Due to any injury.

Trophoneurosis, Lack of nutrition, due to nerve disease.

Tubercle, Small solid elevation of the skin.

Tubercular, Similar to Tubercle.

Tuberculosis, Infection of system with *Bacillus Tuberculosis*.

Uka or *Mauka*, Inland, towards the mountain.

Uterine, pertaining to Womb or Uterus.

Vaccinophobia, Fear of Vaccination.

Vagina, Female Genital Canal.

Ventricles, Lower cavities of the heart; (right and left).

Wahine (w), Woman or female.



CAUCASIAN-HAWAIIAN.

PHYSICIANS OF THE LEPER SETTLEMENT

<i>Year</i>	<i>Name</i>
1879	N. B. Emerson (dead).
1880-81	C. Neilson (dead).
1882-84	G. L. Fitch (dead).
1884-87	A. A. St. M. Mouritz.
1888	C. A. Peterson (in office five months); dead.
1888-92	S. B. Swift (dead).
1892-1902	R. Oliver (dead).
1902	F. H. French (in office four months).
1902	W. J. Goodhue (holds office).

* * *

PHYSICIANS OF THE FEDERAL LEPROSARIUM

<i>Year</i>	<i>Name</i>
1909	W. Brinckerhoff (dead).
1909-11	D. H. Currie.
1911-15	G. W. McCoy.
1915-	D. H. Currie (in office).

CHRONOLOGICAL TABLE

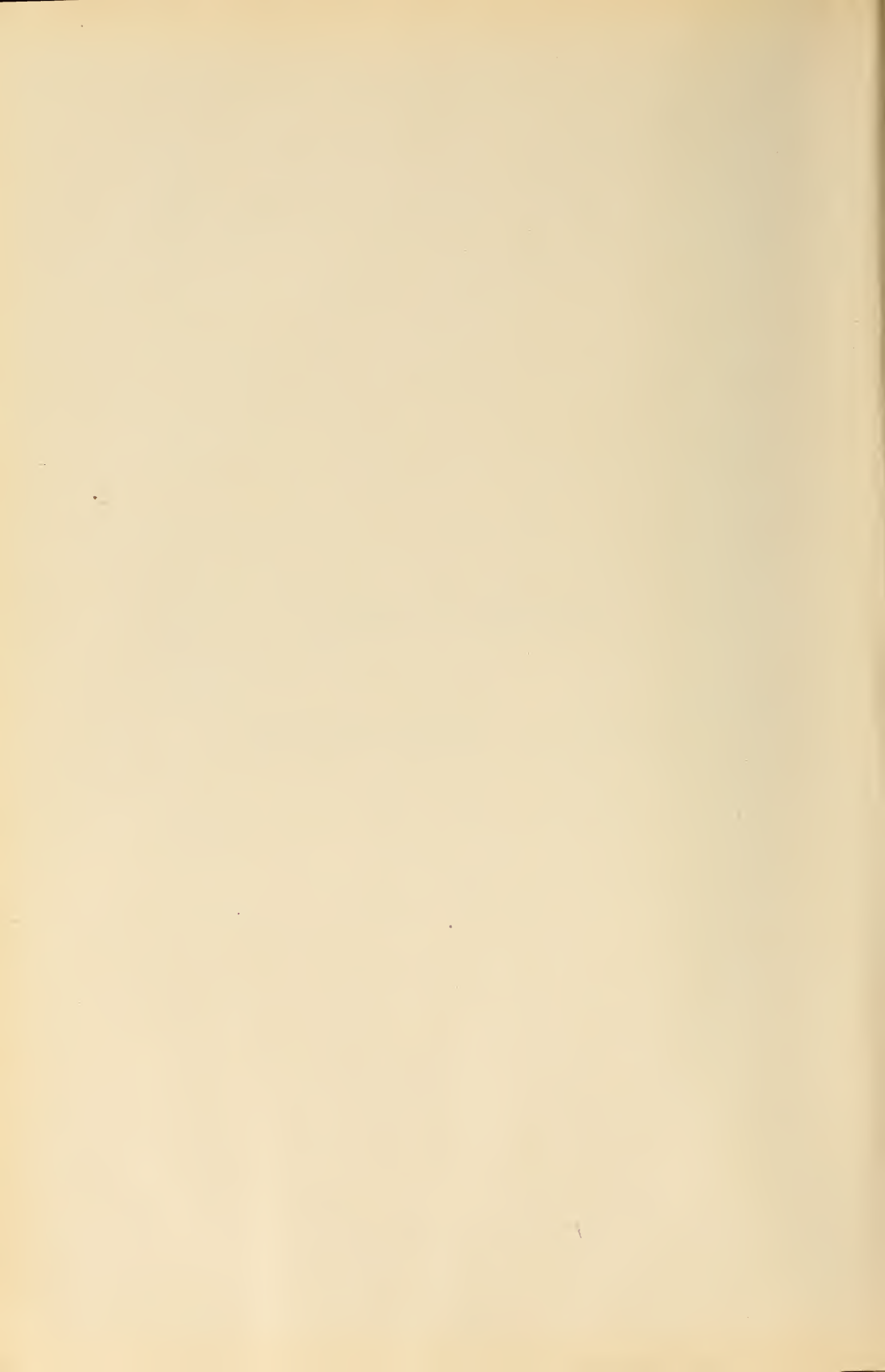
A. D.

- 1555, Nov. 27.—John Gaetano discovers the Island of Hawaii.
 1778, Jan. 18.—James Cook re-discovers Niihau, Kauai, and Oahu.
 1779, Feb. 14.—James Cook killed at Kealahakua Bay, Hawaii.
 1785, July 22.—Ship "Lady Washington" arrives from Boston.
 1787.—Chief Keawe Kaiana visits Canton, China.
 1788.—Chief Keawe Kaiana again visits China.
 1804, June 13.—Russian ship "Neva" arrives, introduces cholera (?).
 1804.—Severe epidemic ravages the islands, "Mai Okuu."
 1820, April 14.—First missionaries arrive from Kailua, Hawaii.
 1823, May 22.—Rev. C. Stewart observes lepers (?) in Honolulu.
 1827, July 7.—Roman Catholic missionaries arrive from France.
 1835.—Leprosy recognized at Koloa, Kauai.
 1840.—Mr. Brickwood observes leprosy in Honolulu.
 1848.—Dr. Hillebrand observes Chinese lepers in Honolulu.
 1850, Aug. 30.—Honolulu officially declared a city.
 1850, Dec. 13.—First Board of Health meets.
 1853, April 28.—Mormon missionaries arrive, five.
 1853, May 13.—Severe epidemic of small-pox prevails.
 1860.—Queen's Hospital erected.
 1863, Dec. 28.—First official discussion on leprosy by Board of Health.
 1865, Jan. 3.—Act to prevent the spread of leprosy enacted.
 1865, Nov. 13.—Kalihi Leper Hospital opened.
 1866, Jan. 6.—Lepers first arrive at Kalaupapa.
 1873, May 10.—Fr. Damien arrives at Kalaupapa.
 1875.—Kalihi Leper Hospital closed.
 1881, Feb. 4.—Epidemic of small-pox prevails.
 1881, Dec. 12.—Kakaako Leper Hospital opened.
 1883, March 31.—Lunalilo Home opened.
 1883, Nov. 8.—Catholic sisters arrive to nurse lepers at Kakaako.
 1883, Nov. 8.—Dr. Arning, leper expert, arrives.
 1884, Sept. 30.—Keanu, the murderer, inoculated (?) with leprosy.
 1885, Nov. 9.—Kapiolani Home dedicated for non-leper girls.
 1886, July 1.—Leprologists Drs. Fitch and Arning leave Hawaii.
 1886, July 29.—Brother Joseph Dutton arrives at Kalawao.
 1888, Jan. 21.—Walter M. Gibson dies at San Francisco.
 1888, Nov. 14.—Nursing sisters arrive at Bishop Home, Kalaupapa.

- 1888, Nov. 19.—Fr. Wendelin arrives at Kalaupapa.
1888.—Kakaako Hospital abolished.
1889, Feb. 6.—Keanu arrives at Settlement from Oahu jail.
1889, April 15.—Fr. Damien dies at Kalawao.
1892, Nov. 18.—Keanu dies at Kalawao.
1894, May 4.—Dr. G. Trousseau dies.
1895, Aug. 22.—Cholera breaks out in Honolulu.
1895, Nov. 2.—Dr. John Brodie dies.
1899, Dec.—Bubonic plague breaks out in Honolulu.
1900, Jan. 20.—Chinatown swept by fire.
1902, Aug. 12.—Dr. Oliver dies (ten years at Leper Settlement).
1902, Oct. 9.—Fr. Wendelin leaves Kalaupapa after fourteen years' residence.
1904, June 4.—Dr. Fitch, leprologist, dies.
1909.—Federal Leprosarium opened at Kalawao.
1909.—Dr. Robert Koch, of Berlin, visits Hawaii.
1910.—Dr. Moses Clegg cultivates the bacillus leprae.
1911, Feb. 23.—Cholera again invades Honolulu.
1911, Oct. 27.—Alleged case of yellow fever at Kalihi.
1912.—Dr. G. A. Hansen dies, discoverer of bacillus leprae.
1914, Sept. 1.—Fr. Wendelin dies.
1915, June 7.—Charles R. Bishop dies, founder of Bishop Home for girls.
1915, June 22.—Rev. F. W. Damon dies, spiritual worker amongst Chinese lepers.
1916, Jan. 6.—High Chiefess Grace Kahoalii dies; semper fidelis.
1916, March 18.—W. E. Rowell, C. E., dies, a man of noble character; his companions through life were faith, hope and charity. (He taught the author the Hawaiian language.)

PART III.

PERSONAL REMINISCENCES



A RESPONSIBLE OFFICE

In connection with the transfer of the first shipment of orphan girls from Kalaupapa to the Kapiolani Home, which I have described in a previous chapter, occurs the name of Ambrose Hutchison, deputy or resident superintendent of the Settlement, an office of great responsibility, for upon his shoulders fell all the burden of the management and general conduct of everything pertaining to the affairs of the Leper Colony on Molokai.

Mr. Hutchison held office for fourteen years, 1884 to 1897—although a victim of neural leprosy, and often rendered unfit by exacerbations of leprous fever and other ailments that followed the progress of the disease in his system—he stuck manfully to his post, and often alone and unaided met serious and unforeseen difficulties with commendable foresight and judgment, and just as often a certain other official claimed all the credit that was due to Ambrose Hutchison.

Mr. Hutchison is a Caucasian-Hawaiian, and now ranks as the second oldest resident, having arrived at Kalaupapa in the month of January, 1879, his period of residence has reached over thirty-seven years. His malady first showed itself about the year 1868, so that he has had leprosy FORTY-EIGHT YEARS. For many years he has been free from the ravages of the disease, which shows apparently the exhaustion of the pabulum or leprogen in the tissues necessary to the sustenance of the bacillus leprae, or the non-activity of his disease may be due to the production of lysins which have destroyed the reproductive powers of the bacilli.

When I resided at Kalawao (1884), Mr. Hutchison was quite a young man (in his twenties), yet he displayed marked ability and highly creditable administrative powers for a man so young. I repeat the responsibility of his office was great. In those days the steamer and mail service were not of the best, and the facilities for landing freight at Kalaupapa were of a negligible quality, boat after boat would be overturned in the surf; the water supply was poor and scanty—a three-quarter inch pipe being the delivery for 800 people.

Mr. Hutchison being the resident official, executive and representative, was the target for all the growlers and kickers, he steered his way, however, through the various problems that came

up from time to time in a manner that would have done credit to much older heads.

For acting as superintendent, sheriff, purveyor, and supervisor of all the details of the civil administration, he was paid the munificent salary of \$30 per mensem!

This same office today pays its holder with perquisites \$400 monthly, and there is less responsibility at the present time than there was thirty years ago, because the act of a present-day superintendent is the direct act of the Board of Health. This body directs the policy of that official, whereas when Ambrose Hutchison held office, he himself was the author and originator of any policy laid down and pursued.

The Board of Health's direct policy only came into existence with the inauguration of a resident superintendent in the year 1897, on the decease of Meyer.

In replying to my request for his life history, Mr. Ambrose K. Hutchison wrote me as follows:

Kalaupapa, Molokai,
Nov. 6, 1914.

In compliance with your request to give you the particulars about myself. It is with great reluctance that I take my pen to write about this matter, for it recalls to memory the pathetic side of my life as a *Condemned outcast and Prisoner*.

That you are not asking me about my life history from mere curiosity, but for scientific research, and knowing well your ability to carry on the same into the dreadful malady, which has been such a virulent scourge of the Hawaiian people, without any sign of abatement after many years of vigorous segregation; having gathered the knowledge in your practice among the people here and elsewhere to write on such a subject, for that reason, I without reserve willingly give you a history of my case.

(Signed) A. K. Hutchison.

I herewith reproduce Mr. Hutchison's *Autobiography*.

"Thirty-five years ago, I and eleven other fellow unfortunates were marched from the leper detention station, adjoining the old police station on King street, a little Ewa of Nuuanu street, through the streets of Honolulu, guarded by policemen, down to the Esplanade, and put on board the little coasting steamer "Mokoli" bound for Kalaupapa, with the Hon. S. G. Wilder, president of the

Board of Health, and Dr. N. B. Emerson, newly appointed resident physician for the Leper Settlement, as passengers.

We arrived at Kalaupapa Sunday morning, January 5, 1879. After landing, our names, ages, and places hailed from were taken down by the Settlement officials; we were left on the rocky shore *without* food or shelter. I had to accept the shelter and hospitality of a friend living at Makanalua about a mile and a half inland from the landing, hence my building a house and taking up my residence there, which has been my home until recently, when I moved to Kalaupapa.

All those fellow passengers that landed with me have passed away, and I am the sole survivor and the longest living resident, save Hoolemakani (w), she has been a resident since the founding of the Settlement in the year 1866.

My connection as an employee of the Board of Health commenced November 1, 1881, when I was put in charge as chief butcher and beef dispenser. On September 25, 1882, I was promoted to the position of head storekeeper of the Board of Health store at Kalawao. I made good and gave satisfaction.

On March 8, 1884, I was appointed and given full charge of the Settlement, filling the position of resident superintendent, and continued uninterruptedly in the management until the close of the year 1889, when I was officially informed of the appointment of Mr. T. E. Evans, as superintendent who was to take charge on January 1, 1890.

When Mr. Evans paid his first official visit, I of course tendered him my resignation. He refused to accept it, and asked me to continue in office as his assistant, which I did, but shortly after I was struck down with paralysis and my recovery was despaired of, but due to the devotedness of my late beloved wife, and the care I received, together with the medicine furnished me by my good friend, the late Dr. George Trousseau, I recovered, after undergoing great physical agony.

Mr. Evans resigned after his trouble with the lepers who assaulted him; he was succeeded by Mr. W. H. Tell, but before a year had passed, he also had some trouble which displeased the Board of Health, and I was asked to assist Mr. Tell. I was then convalescent enough from my severe illness to be able to work, but my assistance did not save him, for the Board voted to remove him from office.

On the 19th of October, 1892, I was again put in charge and continued with the management until December 31, 1897, when

I resigned and declined further work, and went out of office at the above date. I served the Board of Health faithfully for fourteen years, giving the best that was in me to fill the arduous duties of my office.

MR. HUTCHISON'S AFFLICTION—NEURAL LEPROSY

I must have had neural leprosy ten or twelve years (about 1868) before my banishment to Molokai. The first symptoms I noticed were, absence of feeling over my right knee cap, either to touch, pinching or needle prick, the loss of sensation gradually spread down to the ankle and foot; shortly after my left knee, ankle and foot became affected, devoid of feeling; boils broke out simultaneously on both knees. The color of the skin remained natural, but presented a harsh, dry appearance, at this time difficulty of breathing through my nose manifested itself, especially at night, and when sleeping.

I next noticed the wasting of the ball of my right thumb, and the web between the thumb and index finger, ring worms appeared on my face and neck, the soles of my feet began to harden, and the skin became fissured, forming sores and deep ulcers down to the bone, which healed with difficulty.

I next noticed the wasting of my left hand, and the muscles of both arms, the skin of my forehead seemed drawn excessively tight, gradually all the symptoms I have mentioned progressed at an even pace and very slowly. My present condition,—I am physically maimed and weak, and a wreck to what I was before the attack of paralysis laid me low. I am without pains, sores, or ulcers on any part of my body, my hands and feet are much mutilated from the ravages of the disease in the past. I think the leprosy has exhausted itself in my system.

I have no relatives living or dead who have had leprosy; I have never lived with lepers until I came to Molokai.

My boyhood was spent in a boarding school in Honolulu, under the tuition of Archdeacon George Mason. I was born at Honomaele, Hana, Maui, and I am 58 years old.

I have never had a true mother's care. When I was a month old I was given away to my mother's sister,—she was widely known and famed amongst the Hawaiians as a expert kahuna or doctor, well versed in the use of herbs and treatment of sickness.

I have a faint recollection of a man with large ears and bloated face, swollen hands and feet, who used to come to the house where

we lived to be treated by my foster mother. This man's disease in after years I realized was leprosy. I may have become a leper from contact with this man. I also was vaccinated with the matter or lymph taken from another boy's arm, from either of these sources of contagion I believe I contracted leprosy, or it may have been from other unknown sources.

(Signed) A. Hutchison."

Mr. Ambrose Hutchison's history of his life is highly enlightening and interesting, and brings out the following points.

1. The remarkable duration of his malady, 48 years.
2. The harshness and hardship of his transportation.
3. His noble resignation to his hard fate, 36 years in confinement and banishment from the outside world.
4. The suspicion and life long idea that vaccination may have been the cause of his contracting leprosy.
5. His contact *with a Leper at his Mother's house*. I mentioned in previous pages that contact with a leper has occurred in almost all cases of leprosy; on careful investigation, and inquiry this history can nearly always be obtained. There is no possibility of a de novo development of leprosy.

Mr. Hutchison states he was landed at Kalaupapa, and practically dumped on the shore, no provision being made for the reception of himself and fellow passengers. This shiftless and disgraceful neglect no longer exists, the fault lay with the Honolulu authorities, who persistently failed to notify in advance the Molokai officials of the coming of a new consignment of lepers.

This unpreparedness of the officials to receive newcomers worked an injury to the enforcing of segregation, and caused the leper to dread being taken to Molokai, also fake information was spread all over the Islands about lepers dying immediately after being landed at Kalaupapa. This has happened when the leper was in a very exhausted condition, both from the advanced state of his disease and from sea-sickness. Bearing on this matter I relate two cases.

In our winter months when the north wind prevails, accompanied with driving rain, the temperature falls on Molokai as low as 58° F.; this condition of the weather, together with the thin and scanty clothing generally worn by the inhabitants of Hawaii, makes a sick person feel cold, and is liable to induce pneumonia.

On one such night, with similar weather conditions described

above, there arrived at Kalaupapa about midnight the steamer "Mokolii" with freight, and about forty leper passengers.

There was a heavy surf breaking, the wind was from the North and a driving, chilly rain was falling.

If it were not for the able handling of the small boats by the Hawaiian seamen (among the best in the world), they would have been swamped, overturned and broken to pieces on the rocky shore. By a miracle, none of these disasters occurred, and both freight and passengers landed in safety, the latter drenched to the skin by rain and sea.

No advices had been sent in advance of any intention to ship lepers to the Settlement, but the officials were not caught unprepared, both Father Damien and Mr. Ambrose Hutchison had steaming hot coffee and warm food for all who were landed. (The date of this was January, 1885.)

"LITTLE MARY"

I was at the landing, waiting in the lee of the freight house, sheltered from wind and rain, when I was accosted by a diminutive, girlish figure, asking if I was Father Damien, as she carried a letter from the Sisters at Kakaako detention station for him. This little girl, not full ten years old, told a pitiful story—she was soaked to the skin with rain and sea, and shivering with cold, was anxious to get food, shelter and a place to sleep. She was self-possessed, informed me her father had died on the steamer, and was buried at Pukoo, a port of the lee side of Molokai; also on the steamer, too ill to be landed was her little brother 6 years old, who was a leper as well as this little girl herself.

I speedily passed her along to Father Damien and some kokua women, who fed and warmed the child and gave her dry clothing. Her brother was landed at daylight much to the child's delight.

This little girl's name was Mary, and her great dread and worry was that she would have *no house to shelter her*, hence the letter to Father Damien from the Sisters asking him to exercise his good offices in getting this family settled.

The "Mokolii" could and ought to have made direct trips from Honolulu to Kalaupapa, but the Board of Health in their (?) wisdom did not see the necessity of this, hence the steamer made the whole circuit of the island of Molokai before coming to Kalaupapa. This arrangement caused untold misery and suffering. The S. S. Mokolii was small, 96 tons burden, (under the old method

of measurement) had no accommodation for passengers well or sick, excepting on deck. This vessel was far from speedy, could steam 6 knots per hour, had a free-board of 3 feet, yet this miserable little tub of a steamer was kept on the Molokai route for fully 25 years.

This little girl Mary, kept repeating to me her dread of being left out in the dark and cold, with no house for shelter. Later on, I asked the child who told her this, she answered, "Father and other people." Mr. Hutchison's experience on landing was evidently the rule, and not an isolated exception, the conditions attendant thereon must have been wide spread and known all over the Islands.

"NAOMI"

Here again is another case bearing on this point. Naomi, a Hawaiian woman afflicted with leprosy, lived for ten years in the forest between Wailau and Halawa, Molokai, leading a life of terror and anxiety, fearing that at any moment the police would find her.

The great and ever present fear of Naomi was separation from her husband, and then having no one to take care of her, and no house to shelter her at the Leper Settlement.

This woman informed me she would have given herself up and surrendered voluntarily, were it not for stories which she had heard from others about certain conditions at the Leper Settlement, viz., paucity of houses, the first comers filling all the houses, and later leper arrivals having to seek shelter on lanais, under walls or trees, no one to pound poi, or get food or wood for fire and cooking purposes.

About the year 1902, Naomi's leprosy (which she had had about 12 years) had progressed to the extent that it had destroyed her hands and feet, and also her eyes,—she was helpless,—her fingers and adjoining metacarpal bones, also her toes and the metatarsi had all been removed by slow sloughing and necrosis. Her husband was devoted to her, fortunately they had no children. Owing to the necessity of seeking food, the poor shelter from the rain and cold wind that a residence in the mountain forest entailed, and the exhausted condition of Naomi, the husband decided to move her into the Halawa valley; there on the hill side, in a *lantana* thicket, he built a small grass house for her, and shortly after she was arrested there by the police of Molokai on information furnished by an enemy of the family.

Naomi's condition was very pitiful, the leprosy had ravaged her body as I have before described, and she was bedridden and totally blind, yet her husband quietly and respectfully asked me not to separate them, stating that he would look after her as long as she lived, and he would allow no person to come to the house or its surroundings.

I told the husband and Naomi that the Sisters at the Bishop Home would receive her and care for her, and where she would want for nothing.

On thinking the matter over, I decided that Naomi was so weak and exhausted, that there was every prospect of her death on the steamer in transit to Honolulu.

I notified the Board of Health, they accepted my view, and Naomi remained where she was, the husband devotedly caring for her until her death, and living faithfully up to his promise to allow no visitors on his premises.

* * * * *

Throughout the pages of this book I have frequently brought up the subject of the hostility manifested towards segregation to Molokai, some of the objections and complaints are only too well founded.

The question of transportation to Kalaupapa from Honolulu has never received the attention it should, the method pursued is practically the same as it was nearly fifty years ago.

I introduce here part of a letter I wrote to the editor of the *Pacific Commercial Advertiser* and published June 21, 1914.

TRANSPORT OF LEPERS NOT THE BEST

"There is a decided need for improvement in transporting the sick to Molokai. On April 30 ult. forty-nine lepers were taken from Kalihi to Kalaupapa. The accommodation provided for them was the steamer's deck, crew and leper mixing of their own sweet will.

These unfortunate people were landed at night on a surf-bound, rocky shore, and treacherous landing. The same conditions of transport have been in operation forty-eight and a half years."

A PERSONAL EXPERIENCE

THIRTEEN YEARS' RESIDENCE AND LABOR AMONG THE LEPERS AT KALAUWAO

BY

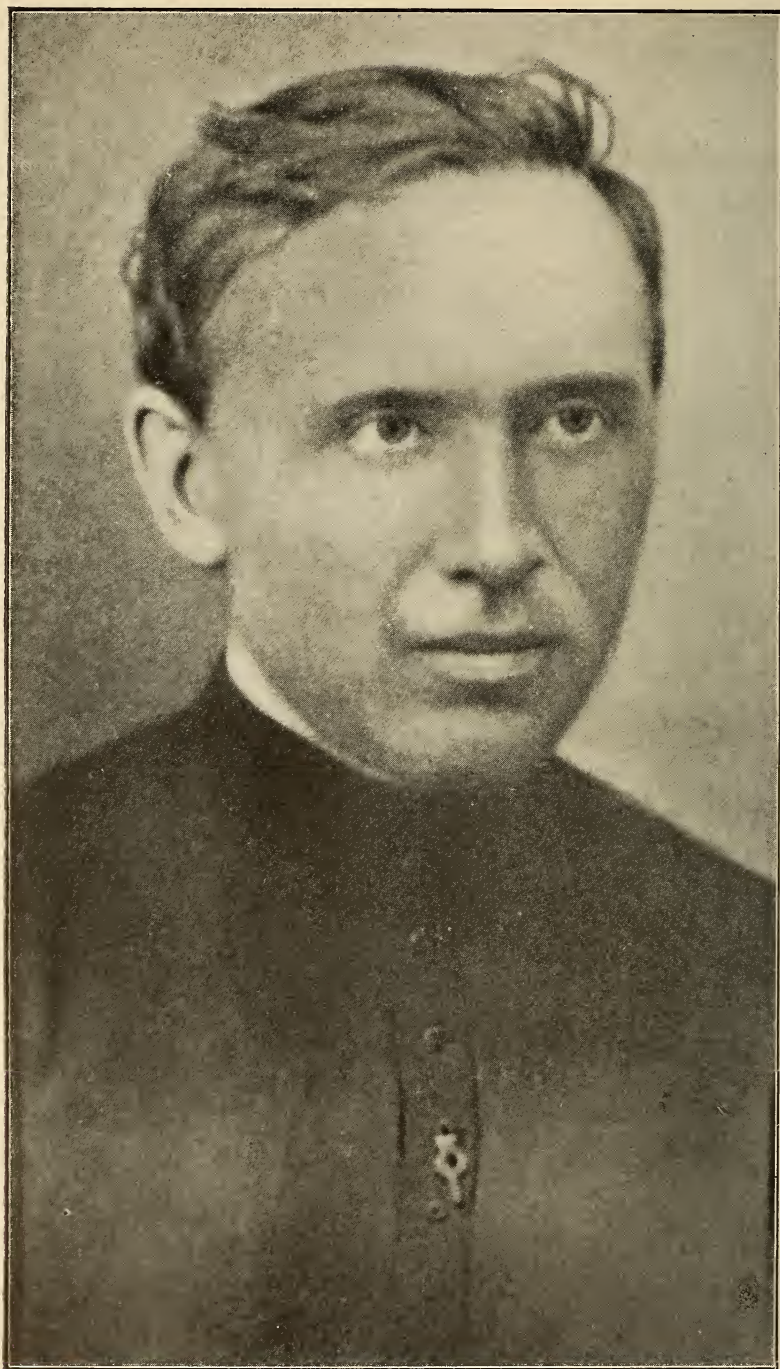
REV. JOSEPH DAMIEN, CATHOLIC PRIEST.

By special providence of Our Divine Lord, who, during His public life showed particular sympathy for the lepers, my way was traced towards Kalauwao in May, A. D. 1873. I was then 33 years of age, enjoying a robust, good health—Lunalilo being at that time King of the Hawaiian Islands, and His Excellency E. O. Hall, president of the Board of Health.

A great many lepers had lately arrived from the different islands; they numbered 816. Some of them were old acquaintances of mine from Hawaii, where I was previously stationed as a missionary priest; to the majority I was a stranger.

The Kalaupapa landing-place was at that time a somewhat deserted village of three or four wooden cottages, and a few old grass houses. The lepers were allowed to go there only on the days when a vessel arrived; they were all living at Kalauwao—about eighty of them in the hospital, in the same buildings we see there today. All the other lepers, with a very few kokuas (helpers), had taken their abode further up towards the valley. They had cut down the old pandanus, or puuhala groves, to build their houses, though a great many had nothing but branches of castor oil trees with which to construct their small shelters. These frail frames were covered with ki leaves (*Dracaena terminalis*), or with sugar-cane leaves—the best ones with pili grass. I myself was sheltered during several months under the single pandanus tree, which is preserved up to the present in the churchyard. Under such primitive roofs were living pell-mell, without distinction of ages or sex, old or new cases, all more or less strangers one to another, those unfortunate outcasts of society. They passed their time with playing cards, hula (native dances), drinking fermented ki-root beer, home-made alcohol, and with the sequels of all this. Their clothes were far from being clean and decent on account of the scarcity of water, which had to be brought at that time from a great distance.

The smell of their bodies, mixed with exhalation from their



FATHER DAMIEN,
Aged twenty-six years.

sores was simply disgusting and unbearable to a new-comer. Many a time, in fulfilling my priestly duty at their domiciles, I have been compelled not only to close my nostrils, but to run outside to breathe fresh air. To protect my legs from a peculiar itching which I usually experienced every evening after my visiting them, I had to beg a friend of mine to send me a pair of heavy boots. As an antidote to counteract the bad smell, I made myself accustomed to the use of tobacco, whereupon the smell of the pipe preserved me somewhat from carrying in my clothes the obnoxious odor of the lepers. At that time the progress of the disease was fearful, and the rate of mortality very high.

These are a few of my recollections of what I have seen and experienced at the beginning of my labor here. The miserable condition of the Settlement at that time gave it the name of a living graveyard, which name I am happy to state, and hope to prove hereafter, is today no longer applicable to our place.

From the accession of King Kalakaua to the throne up to the present time, His Majesty's Government, assisted by Christian charity, has endeavored, little by little, according to means and circumstances, to improve the situation of the lepers, and to make them more comfortable.

Consulting my own observations and experiences only, without any memorandum book or register, I intend to show here what contributes much towards the comforts and benefits of lepers, and what is obnoxious or injurious to them, and will prove these two statements by putting our good situation and comfort in parallel, with what I found here at my arrival, as already explained.

THE DIET OF THE LEPERS

The food on which a leper has to live exercises a great influence on the disease. Our Hawaiian taro, containing a great quantity of starch, and being easy of digestion, is our best vegetable. So far, I have never seen any bad effects from it, even in fevers and other temporary ailments to which our lepers are so often subjected to. Hawaiian people in general, but especially our lepers, cannot go well without it. I remember that, some ten years ago, the place having been about three months without taro on account of the scarcity of that vegetable, several deaths occurred in consequence of it, and the majority of the people looked emaciated, although they had plenty of rice and sweet potatoes.

The administration having to supply weekly from six to seven

hundred people, each with twenty-one pounds of cooked taro, a few words concerning the manner how it is obtained may be desirable.

At the northern side of Molokai are three large valleys, viz., Halawa, Wailau, and Pelekunu, in which the cultivation of taro is the chief business of a considerable number of natives. On them especially we have to rely for our regular supply. The high cliffs preventing all overland road traffic, the cooked taro, or paiai, has to be brought by sea either in open boats or a small schooner, as was done from the beginning, or in a small steamer latterly.

The steamer's service has been highly appreciated by the public on account of its regularity, schooners and boats being often prevented by calm or rough weather from arriving when the food is wanted; unavoidably, our people are then deprived of their good poi, which is left to rot where it was cooked, causing great loss to all concerned. If poi cannot be obtained, the issue of rice or hard bread takes its place, of which there is always a certain quantity on hand, though it is recognized that, with the exception of the Chinese, neither native nor foreigner could live on rice as principal food.

A certain number of our people, with their more or less mutilated hands, succeed in raising a few sweet potatoes, which answer well for a change in the diet, or in case of emergency. Unfortunately some of our Hawaiians are much addicted to the use of a certain beverage made of sweet potatoes, which they allow to ferment, and thus obtain an obnoxious, intoxicating drink. They are very fond of it, but it makes them excited, and has a bad effect on their system, as have all other alcohols; and I wish to express here my sincere thanks to our local administration for having wisely prohibited the use of it.

Besides their regular food, a pint of good milk provides them advantageously with a wholesome, nourishing beverage in the line of diet. The question naturally occurs to the mind of the reader, how can a sufficient quantity of milk to supply such a number of people be procured? May I be allowed to explain my views on this.

This Settlement, in the greatest part, affording the best kind of grazing for stock, I would suggest to the administration with all my might to increase as much as possible the number of good milch cows. UNFORTUNATELY, ON ACCOUNT OF THE GREAT AMOUNT OF MEAT WANTED, ABOUT FIVE THOUSAND POUNDS A WEEK, AND THE FREQUENT FAILURE OF THE ARRIVAL AT THE REGULAR TIME

OF BEEF CATTLE, OUR BUTCHERS ARE SOMETIMES OBLIGED TO KILL OFF MORE OR LESS OF OUR VALUABLE MILK STOCK, WHICH KEEPS THE LATTER ON A DECREASE, AND THEREFORE LESSENS TERRIBLY THE SUPPLY OF MILK.

Let me regretfully state, it is now several years, up to the present day, that not one-tenth of our lepers outside of the hospital yard have been enabled to enjoy the benefit of a small daily supply of milk.

I beg leave to be allowed to make here a suggestion for the benefit of the Board of Health and for the lepers. May it be proposed at the next Legislature to make, besides the regular appropriation for the support of the lepers, an additional one, such as to provide the necessary means for buying at once as many head of cattle as our beautiful plain for grazing can support,—say from 500 to 1000 head, of which a certain number should be used for breeding and milk, and the rest for beef cattle. In regard to salmon, as a substitute for meat, I simply will state that it may do once in a while, but the less the better.

THE WATER SUPPLY OF THE SETTLEMENT

From the landing-place of Kalaupapa up to Kalauwao we have no regular water stream. Fortunately, at the upper part of the Kalauwao valley there is one, but the water is not very abundant, though sufficient, if properly managed, to supply this one village. When I first arrived here the lepers were obliged to carry their water in oil cans from that gulch on their shoulders, or on horses, under the greatest difficulty; there also they used to wash their clothes. The scarcity of water at that time accounted, to some extent, for their living very dirty.

In the summer of A. D. 1873, we received some water pipes, and all our able lepers were only too willing to help in laying them, and in building a small reservoir. Since then Kalauwao has been well supplied with good water for drinking, bathing, and washing, and has been proved to be a better place for living than Kalaupapa, where the people continue to resort to rain or brackish water, and in dry seasons they are obliged to come to Kalauwao for it.

On studying this question of water supply, I was informed that at the terminus of the valley called Waihanau (water arise), which valley is located a little more than one mile southeast of

Kalaupapa, there is a natural reservoir. At one time in company with two of our intelligent white men and some of my boys, I went to investigate the truth of it, and, after two thousand feet of travelling in the gulch, we arrived at this truly beautiful reservoir, built by Nature's hand in the form of a circular basin; its diameter in one direction is 72 feet, and 55 in the other.

On sounding its depth we found twelve feet of water at a short distance from the bank, and eighteen feet towards the center. The water being ice-cold, none of my boys dared to swim across to ascertain its true depth close to the high cliff, where probably it is deeper. The water looks very clear and has an excellent taste. I should remark here the statement which a native, who, during the period of ten years, has made it his business to deliver water to any part of Kalaupapa for a certain fee, made to me, viz.: "That if no other source in the vicinity affords any water during very dry seasons, this basin has never failed to furnish any amount needed." The above statement was acknowledged to be true by a great many more of the old residents who had seen that reservoir and confirmed it. This, and the large overflow in connection with the drainage from above, leaves me to conclude that there must be a large feeding source below. This reservoir is perfect and permanent in itself, without incurring any expense or labor.

Now, instead of going to Waikolu to obtain a water supply for Kalaupapa, as was intended, which would be besides the difficulty of labor of building a reservoir and for laying from such a distance, say over five miles, the amount of pipe required for that purpose, a very large expense to the Government, therefore I simply recommended the laying of good pipe from this Waihanau reservoir. The question of supplying water for Kalaupapa has been for a long time under discussion, and never thoroughly investigated, under the impression that it would cost too much, and there the matter rests at present.

My desire being to see the work carried on without any further delay, once I was sure of getting this supply of beautiful water at a comparatively short distance, and wishing to give all information necessary, I have taken the pains to measure the exact distance, which I found to be from the reservoir to the Kalaupapa store-house thirteen thousand six hundred and eighty (13,680) feet. All this distance is on an uninterrupted, gradual decline; and having on hand a better reservoir, and a surer supply of water than we have at Kalauwao with a 2-inch pipe for half the distance, and

1½-inch for the remaining part, without a doubt the Kalaupapa village can be abundantly supplied with good, pure water. And having here a man capable of executing such a work, with many hands to assist him, I think that the expense above the cost of the pipe would be but a trifle.

THE DWELLINGS OF THE LEPERS

Good ventilation being in general one of the first conditions of hygiene, it is much more necessary for our lepers, on account of the foetid exhalations from them being much greater than from any other disease.

In previous years, having nothing but small, damp huts, nearly the whole of the lepers were prostrated on their beds, covered with scabs and ugly sores, and had the appearance of very weak, broken-down constitutions. In the year 1874, the great question was how to improve the habitations of the unfortunate people, the Government appropriation being at that time barely enough to provide them with food?

During that winter a heavy south wind blew down the majority of their half-rotten abodes, and many a weak leper laid there in the wind and rain, with his blanket and clothes damp and wet. In a few days the old grass beneath their sleeping mats began to emit a very unpleasant vapor. I at once called the attention of our sympathizing agent to the fact, and very soon there arrived several schooner loads of scantling to build solid frames with. All the lepers who were in distress received, on application, the square laths to thatch the grass or sugar cane leaves to. Afterwards rough N. W. boards arrived, and also the old material of the former Kalihi hospital. From private and charitable sources we received shingles and flooring. Those who had a little money hired their own carpenters; for those without the means the priest, with his leper boys, did the work of erecting a good many small houses. Besides, some new comers who had means built their dwellings at their own expense.

In 1878, after the inspection of the Settlement by a special committee, of which Your Excellency, then a member of the Assembly, was chairman, sent by the Legislature to Kalauwao, the Board of Health having obtained a larger appropriation by a special recommendation of that committee, at once erected a good many comfortable houses, and also provided several other comforts for the lepers, of which they were greatly in need.

Lime has always been supplied by the Board of Health gratuitously for whitewashing the cottages, and thus, little by little, at comparatively small expense to the Government, combined with private and charitable resources, were inaugurated the comfortable houses which constitute today the two decent-looking villages of Kalauwao and Kalaupapa. I estimate the number of houses at present, both large and small, somewhat over three hundred, nearly all whitewashed and, so far, clean and neat, although a number of them are not yet provided with good windows. These houses, of course, cannot have the proper ventilation they need, and naturally create an unpleasant and unhealthy smell; I therefore humbly pray that the Board will be kind enough to take steps and see that this still-existing evil be soon remedied. In conclusion, I am happy to remark that, if I compare the present with the past, the unfortunate people of today are not only more comfortable and better off in every respect, but their disease in general is a great deal milder and less progressive, and, in consequence, the death rate is not so high. This is greatly due to the improvement in the houses.

THE CLOTHING OF THE LEPERS

The Settlement being situated at the northern side of the island, and backed at the south by very high and steep mountains, the climate is naturally cool. The winter season brings forth generally a long spell of cold weather. The disease, too, at a certain stage, interferes much with the free circulation of the blood, and therefore our lepers often complain of cold. Those who have suitable and warm clothes to protect themselves from the inclemency of the weather resist it generally very well, but for those who, through neglect or destitution, have barely enough to cover their nakedness, the cold and damp weather has a bad effect. They then begin to feel feverish and cough badly; swelling in the face and limbs sets in, and if not speedily attended to the disease generally settles on the lungs, and thus hastens them on the road to an early grave. On my arrival I found the lepers in general very destitute of warm clothing. So far they had received from the administration a suit of clothes and a blanket; but some of them being very neglectful and filthy, in a few months nothing remained but rags. Those who had friends in the outer world were fortunate in receiving from time to time a few articles of clothing, but the friendless and the poor suffered greatly. There was no store at the time within the limits of the Settlement where

they could buy a few garments or other necessities, and those who received or could earn some money had to entrust it to the captain of the schooner to buy for them what they were in want of.

We all greatly felt the necessity of a suitable market store, and, on a very sound principle, the Molokai store was inaugurated by the Board of Health in the summer of 1873. To start with, a thousand dollars out of the appropriation was invested to lay in the first stock, and with a certain percentage above the cost price to cover current expenses, the store has since then been running on its own account, supplying our people with any article they may wish to buy. Each year the the Board issues an order for six dollars to each leper to enable them to buy at the said store what they are in need of, especially in the line of clothing. So far, this store has proved to be a success and a great convenience to the people here, and we could not do very well without it.

Besides the allowance by the Board of Health, Christian charity has given us a helping hand in the matter of clothing, and assisted us to our great satisfaction. In previous years it was nothing unusual to receive from time to time a cart-load of clothing for distribution to the needy; for instance, such as were received a year and a half ago from the hands of Her Majesty Queen Kapiolani, and those who assisted her in filling the leper subscription. Thanks for the aid in the past. May the future prove that untiring perseverance of charity continues to assist the Board of Health in supplying the unfortunates of Molokai with all their necessities; especially with warm clothing, because, may I here remark, that the yearly allowance of six dollars to provide clothes and other indispensable articles is quite insufficient for those who have no private means, and no friends or relatives to give them a helping hand. I beg to lay this statement, based on a long experience, before the honorable Board of Health for future consideration.

The allowance granted by the Board, combined with Christian charity and some private industry, of which I intend to speak hereafter, has greatly ameliorated the condition of our lepers and provided them with comparatively good clothes.

EXERCISE FOR THE LEPERS

Leprosy is a constitutional disease by which, generally, the circulation of the blood is partially obstructed, the nerves and muscles more or less paralyzed, and the limbs are often disabled in one place or the other, which varies in almost every case.

A person afflicted with leprosy, who quietly gives himself up to the ravages of the disease and does not take exercise of any kind, presents a downcast and sloughy appearance, and threatens soon to become a total wreck. Therefore exercise, as a daily occupation, is highly commendable to invigorate the system, giving a fresh impetus to the general movement of the muscles and to the free circulation of the blood, thus averting many pains, sores, and other consequences of a prostrated constitution.

In former days (from 1866 to 1873), all the lepers being collected at the rather small village of Kalauwao, the majority of them passed their time in sleeping, drinking, and playing cards, while only a few others cultivated the fields; and horses being limited at that time, a minimum number only of the inmates could enjoy the exercise of a horse-back ride.

Later on, all that tract of land at Kalaupapa having been annexed to the Leper Settlement, traveling was at once increased to a great extent; going from one village to the other became not only a healthful exercise and pleasure, but of a frequent necessity; horses too have increased, and are easily procured. This tract includes a very fertile piece of cultivable land—over two hundred acres are fenced in along the foot of the mountains. Every leper is privileged to occupy any vacant portion of it he may choose to cultivate, as some were already accustomed to do in the Kalauwao fields.

Traveling on foot, riding on horseback, and cultivating the soil are the most healthy occupations of our lepers. Let me, therefore, bring to notice that, up to the present date, about nine-tenths of the entire population are enjoying these invigorating occupations and exercises, while previously only about one-tenth could do so. Such daily exercises as can be obtained here does not only strongly aid in checking the disease in its rapid progress, but also averts many ailments which otherwise might befall the victim. Inducements of this kind, in regard to daily exercise for the welfare of all afflicted which this Settlement affords, cannot likely be gotten up in any other asylum in the world.

In regard to the wholesome exercises obtained by cultivating the soil, a few facts showing how it has been and should continue to be encouraged, may here be brought under observation. Soon after that piece of land mentioned above had been put at the disposal of the lepers, many whose hands were not too much mutilated began at once to plant a patch of sweet potatoes, and very soon had an abundant crop.

During the winter when the boats which had to supply the Settlement with taro were prevented from arriving on account of the bad weather, the local administration was fortunate enough to get a weekly supply of sweet potatoes from those who had a quantity at their disposal, and thus not only prevented a temporary famine, but the money usually paid to the outsiders for paiai was paid into the hands of our lepers, and, little by little, money came into circulation among the poor people. This being a great encouragement, very soon the majority had some potatoes of their own planted, and shortly afterwards they petitioned the local administration to obtain instead of their weekly rations its equivalent in money. This having been granted, numbers of lepers availed themselves of this opportunity to obtain some cash to buy their little necessities with.

This system of paying money, instead of giving the weekly supply, continued for about eight years, varying in amount according to the harvest of sweet potatoes, and sometimes through the deficiency of taro. Besides the great benefit of a healthy exercise for the sick, their monthly ration money not only alleviated the condition of those who availed themselves of it, but brought money into circulation, and created between the two villages many other kinds of small industries.

The Leper Settlement store, too, at that time had a larger business, because there was money in the hands of the people, who, in general, called there to provide for all their different needs.

Up to within recently the people were in comparative ease at the Settlement, but at present the system of paying the equivalent of rations, on account of abuses having been taken away, though they have enough to eat, they are, nevertheless, getting in very poor circumstances. This system was very beneficial for the health and comfort of the lepers, as I have shown, and not any more expensive to the Board of Health, therefore, in the interest of the great majority, I humbly suggest that the administration will have the kindness to resume the old practical system.

THE KOKUAS, OR ASSISTANTS, WHO ACCOMPANY THE LEPERS TO THE SETTLEMENT

On this important subject, distinction has to be made between married and unmarried kokuas. I think it is but justice, and in accordance with Divine and humane law, that faithful husbands

and wives of lepers should be allowed to accompany their partners to their exile at Kalawao.

In the fulfillment of my duties as priest, being in daily contact with the distressed people, I have seen and closely observed the bad effect of forcible separation of the married companions. It gives them an oppression of mind which, in many instances, is more unbearable than the pains and agonies of the disease itself. This uneasiness of the mind is, in course of time, partly forgotten by those unfortunates only who throw themselves into a reckless and immoral habit of living. Whereas, if married men or women arrive here in company with their lawful mates they accept at once their fate with resignation, and very soon make themselves at home in their exile. Not only is the contented mind of the leper secured by the company of his wife, but the enjoyment of good nursing and assistance, much needed in this protracted and loathesome disease, and which no other person could be expected to impart.

I am happy to be able to state that the marriage ties of lepers have been more respected by His Majesty's Government during the past few years than they used to be; the physical and moral life at the Settlement has greatly improved, and the lepers are much better taken care of. Besides this, our good kokuas are not only of great help and assistance to individual lepers, but they are also of great value to the local administration for carrying on all work needed for the welfare of the place. May I bring to the notice of the honorable members of the Board of Health that not only is our Settlement benefited by such kokuas, but the public at large are rid of a dangerous element; and I must assert that it is my solid opinion that all persons, with a very few exceptions, who have cohabited in the matrimonial state a certain length of time with a leper are a standing menace to society at large, of which only too many proofs have unhappily come under my personal observation. I here leave the medical profession to settle to what extent the danger of contagion or non-contagion through cohabitation may extend.

I am happy to give the present Board of Health credit for their lenient action in this important matter, at the same time I am obliged to mention that I disapprove the coming of all others but married kokuas to the Settlement, with the intention of making it their place of abode. My disapproval of seeing unmarried kokuas settle here is based on the following reasons:

1. Because, with the exception of a few old people, unmarried kokuas are not generally faithful and persevering in assisting those patients in whose favor they were permitted to come here.

2. They are, in general, a source of immorality and a temptation to lead the lepers into bad habits, and, through their bad example, sometimes create trouble in the place.

3. Because, having no natural tie here, they, after a long intimacy with the lepers, may leave the place whenever they choose, and although the disease may not yet be visible, it is highly probable that they carry the germs of it to their homes, and thus become a well-fitted medium to spread the disease amongst their numerous friends.

4. They are of very little use here, if of any at all. They will not do anything for the poor sufferers except for payment, with the proceeds of which they go gambling and generally go around from house to house and help to consume the poor lepers' scanty rations; they have no fixed abode, and are too lazy to work for their own support; in some instances they even try to obtain the lepers' clothing by some means or other.

For these serious reasons I venture to recommend to the authorities that they be more strict in the future than they have been in the past years; and, to prevent imposition, let proof be shown of legal marriage before a permit is granted. Moreover, temporary visits which may be allowed to elderly people should be always of the shortest possible period, and the strictest severity should be resorted to in order to prevent any healthy child or young person from entering the Settlement.

THE MORALITY OF THE LEPER SETTLEMENT

I feel myself obliged to beg leave of Your Excellency to be allowed to speak of a very serious matter, in which I officially appear as one of the principal agents. To avoid criticism I will, with a liberal mind, lay aside as much as possible all difference of creed and opinion, and show how needful a step has been taken for the temporal and eternal welfare of our lepers by drawing a parallel between the past and the present, and between those who yield and do not yield to moral training.

Previous to my arrival here it was acknowledged and spoken of in the public papers as well as in private letters, that the greatest want of the lepers at Kalawao then, was not having a spiritual leader or priest, the consequence of which was that vice, as a general



PRIMITIVE CATHOLIC MISSION PREMISES.

Kalapana, Puna, Hawaii. The scene of Fr. Damien's first parish work, A. D. 1864.

rule, existed instead of virtue, and degradation of the lowest type went ahead as a leader of the community. On the arrival of a new number of lepers, the old ones were soon at work to impress them with the erroneous axiom: "Aole kanawai ma keia wahi," in this place there is no law. Not only in private conversation, but in public meetings, I myself heard this doctrine proclaimed; and for a long time, indeed, I was obliged to fight against its application being made to the Divine law as well as to human law. In consequence of this impious theory, the people, mostly all unmarried, or separated on account of the disease, were living promiscuously without distinction of sex, and many an unfortunate woman had to become a prostitute to obtain friends who would take care of her, and the children, when well and strong, were used as servants. When once the disease prostrated them, such women and children were cast out, and had to find some other shelter; sometimes they were laid behind a stone wall and left there to die, and at other times a hired hand would carry them to the hospital. The so-much-praised "aloha" of the natives was entirely lacking here, at least in this respect.

As already mentioned in other pages, the Hawaiian "hula" was organized after the pagan fashion, under the protection of the old diety Laka, who had his numerous altars and sacrifices, and I candidly confess that I had hard work to annihilate Laka's religion and worship, and thereby put a stop to the hula and its bad consequences. Though the people had reached the climax of despair, both of soul and body, may it be said to their honor that I found them less addicted to sorcery and the doings of the "kahuna Lapaaus," or native doctors, than I had found the old natives in Hawaii—circumstances which encouraged me much to stay permanently amongst them, with the quasi certain hope of my ultimate success as a Catholic priest.

By a short digression I will speak of another source of immorality, viz.: the evil effects of intoxication. I first have to explain how they obtained the material. There grows very abundantly along the foot of the mountains a plant which the natives call "ki" (*Dracaena terminalis*), the root of which, when cooked, fermented, and distilled, gives a highly intoxicating liquid. The process of distilling being very crude and imperfect, produces, naturally enough, a liquor which is totally unfit for drinking. A short time after my arrival the distilling of this horrible liquid was carried on to a great extent. Those natives who fell under the influence of it would forget all decency, and run about in a

nude condition, acting as if they were totally mad. The consequences can be easier imagined than written on paper. The local authorities have endeavored to stop all those horrible proceedings, but for a long time they were unsuccessful. It being discovered that certain members of our police were in league with the evil-doers, the "luna nui" and *myself* went around and both by threats and persuasion, they finally delivered up their implements which were used for distilling; some of the most guilty perpetrators were convicted, but were pardoned under the condition never to do it again. (See page 238, the dissolute element abuse Damien.)

For a long time, as above stated, under the influence of this pernicious liquor, they would neglect everything else except the hula, prostitution, and drinking. As they had no spiritual adviser they would hasten along the road to complete ruin. A good many of the sick and prostrated were left dying there to take care of themselves, and several of them died for want of assistance, whilst those who should have given a helping hand were going around seeking enjoyment of the most pernicious and immoral kind.

As there were so many dying people, my priestly duty towards them often gave me the opportunity to visit them at their domiciles, and although my exhortations were especially addressed to the prostrated, often they would fall upon the ears of public sinners, who, little by little, became conscious of the consequences of their wrecked lives, and began to reform, and thus with the hope in a merciful Savior, gave up their bad habits.

Kindness to all, charity to the needy, a sympathizing hand to the sufferers and the dying, in conjunction with a solid religious instruction to my listeners, have been my constant means to introduce moral habits among the lepers. One of the great moral improvements which helped to do away with licentiousness was the granting of inter-marriage licenses between lepers who were not prevented from marriage by a previous marriage tie, and many a couple are today living at the Settlement in a decent manner.

I am happy to say that, assisted by the local administration, my labors here, which seemed to be almost in vain at the beginning, have, thanks to a kind Providence, been greatly crowned with success, as, at present, there are very little, if any at all, of the above mentioned evils committed.

MEDICAL TREATMENT

Leprosy, from time immemorial up to the present, has always been recognized as an incurable disease. In laying my views before Your Excellency, with regard to medicine, I must draw distinction between a developed and an incipient case. In regard to the first, a judicious medical treatment may be followed up with advantage, to ameliorate the condition of a leper, to alleviate his pains, and to stay somewhat the progress of the disease; but not with the view of obtaining a perfect cure, for such a blessed effect we must look for, and can only hope, in a supernatural gift.

Perchance, in the near future, through the increasing interest and untiring perseverance in the study of the disease by the most intelligent physicians and scientists, a proper specific for the cure of leprosy may be discovered, which to my knowledge has not yet been found.

In regard to an incipient case, where the disease is not yet developed, there, in my opinion, with proper medicine, good diet, cleanliness, complete separation from all leprous persons, and other necessary means, taken with perseverance, there only the hope to eradicate the disease from the system, or at least its progress entirely checked, may be entertained. It is now about twenty years since this Settlement was established, and this term may be divided in three separate periods.

As I arrived here at the end of the first period, 1866 to 1873, I can only state how I found things at that time. I remember well that the poor people were without any medicines, with the exception of a few physics and their own native medicines, from which, I judge, it had been the same from the inauguration of the Settlement. It was a common sight to see people going around with fearful ulcers, which for the want of a few rags, or a piece of lint and a little salve, were left exposed to dirt, flies, and vermin. Not only their sores were neglected, but anyone getting a fever, diarrhoea or any other of the numerous ailments that lepers are so often heir to, was carried off for want of some simple medicine.

In the same year of my arrival at the settlement, 1873, there arrived a white man, a leper himself, who had been an assistant to the doctors at the Kalihi hospital. He had quite a practical knowledge of simple medicine, and having been put in charge of our hospital, he especially attended to the patients there, while I, for my part, attended largely to those living outside. Our stock

of medicine, the greatest part of which was always supplied by the Board, consisted of the most common necessities. Very soon, the people perceiving that by the use of such simple medicines as we had to dispose of their troubles were generally greatly ameliorated, and therefore they begun to call more and more for the simple remedies, and thus gradually a perceptible improvement took place. As we had no doctor during this second period, we tried to do the best we could.

*To His Excellency Walter M. Gibson,
President of the Board of Health.*

Dear Sir: I herewith enclose the report of my observations and action at the Leper Settlement during a residence of thirteen years, which Your Excellency requested me to prepare. Hoping that it will meet your views,

I remain Your Excellency's most humble servant,

J. DAMIEN, Catholic Priest.

Kalauwao, March 11, 1886.

FATHER DAMIEN--PRIEST, LEPER, POPULAR HERO

Joseph Damien de Veuster, otherwise popularly known as Fr. Damien, was born at Tremeloo, a small village near Louvain, Belgium, on January 3, 1840, and died at Kalawao, Molokai, April 15, 1889, of nodular leprosy, aged forty-nine years, three months, and twelve days.

His parents were in humble circumstance, his father owning a small farm, less than ten acres. His studies for the priesthood were pursued at the University of Louvain, and afterwards at Paris.

He arrived at Honolulu on March 19, 1864. Previous to his taking up his residence at the Leper Settlement, he had charge of the work of the Catholic Mission at Kohala, island of Hawaii, and the Puna district.

ARRIVES AT KALAWAO

On Saturday, May 10, 1873, Bishop Maigret, head of the Catholic Mission in the Hawaiian Islands, and Fr. Damien landed at Kalaupapa, Molokai, from the steamer "Kilauea."

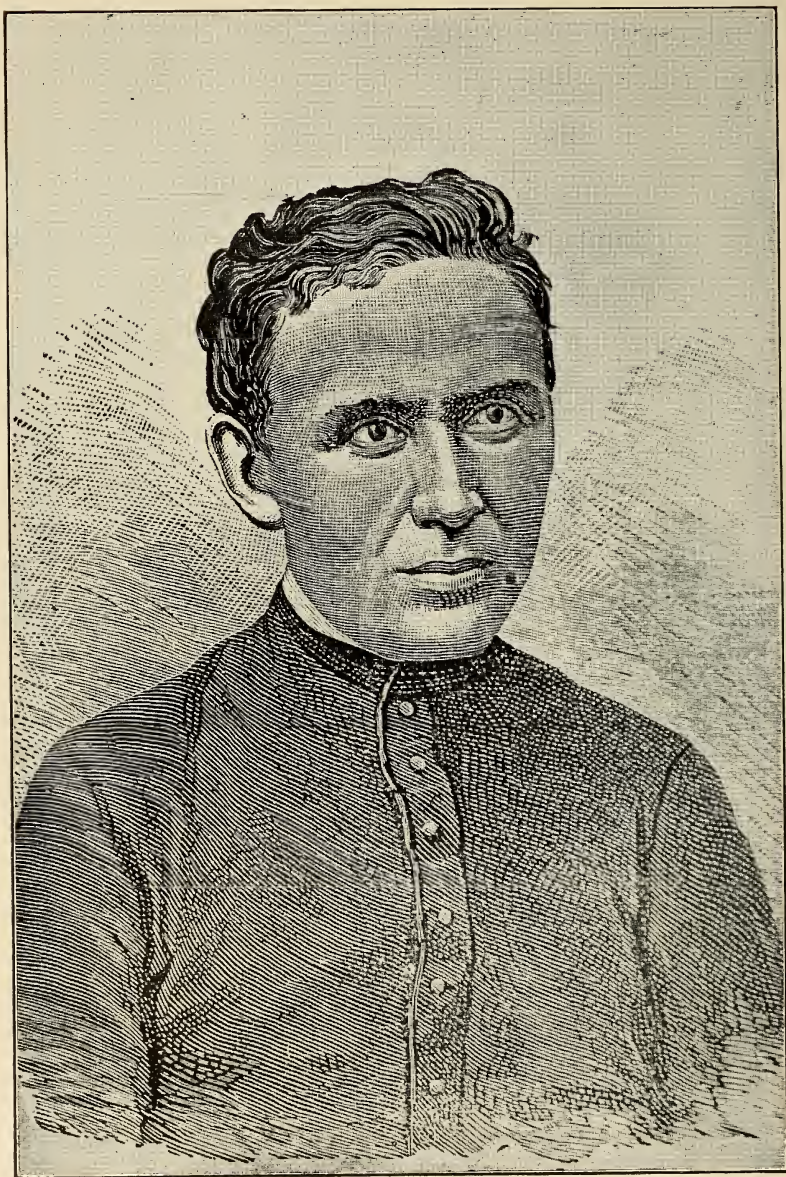
The Bishop returned to Honolulu on the same steamer, after addressing the assembled lepers and informing them, that Fr. Damien would remain and make his home with them and devote his life to their spiritual welfare and care.

The Leper Settlement had been in active operation since January, 1866; the lepers, for a period of more than seven years, being without any resident priest. In the year 1872, Brother Bertram had built a church at Kalawao, which was dedicated on May 30th of the same year to St. Philomena by Fr. Raymond Delalande.

The Protestant church at Kalawao, "Siloam," was erected in the year 1870, and was in charge of a native Hawaiian pastor.

PHYSICAL APPEARANCE

Fr. Damien was in the thirty-fourth year of his age when he began his work amongst the lepers. When I went to reside at the Leper Settlement in the fall of the year 1884, Damien was then in his forty-fifth year. He was active and vigorous, of good physique, upright in his carriage, measured 5 feet and 8 inches in height, weighed 204 pounds, his chest was 41 inches in circumference, his hands and feet were shapely, although his fingers were stubbed and calloused from toil.



FATHER DAMIEN,
A. D. 1873.
In His Thirty-fourth Year.

His features were regular, his face fleshy, round, and of good dimensions; the color of his eyes brown, his hair black and abundant; his forehead of average breadth and height. He had a clear ringing voice, possessed a powerful barytone, and was a good singer.

The view of his full face gave the onlooker the idea of force, harshness and sternness, due in part to the squareness of his chin and lower jaw. His profile was handsome, was softer and more in harmony with the entire cast of his features than the view his full face presented. Very few of the photographs of Fr. Damien do justice to him; his face as sculptured on the monument at Kalawapa bears but an imperfect and faint resemblance to his features.

Having a wealth of hair, he roamed about bareheaded, resulting in his face becoming bronzed by exposure to the wind and sun's rays.

The first meeting I had with Fr. Damien the dark copper color of the skin of his forehead attracted my attention, it was the visible proof of the invasion of the Destroyer.

TEMPERAMENT

His temperament was mixed, nervo-bilious, the former element predominating; he was easily excited, easily peeved, supersensitive, and difficult to get along with at times. Damien and I clashed and snapped repeatedly. His years of residence at the Settlement had made him an autocrat on all matters; he had very fixed views and brooked no interference with his will. His unyielding attitude on many affairs outside his proper sphere of work brought him in conflict with the Board of Health and the workers connected with the other religious sects at the Settlement.

Kalawao had its loafers, illicit distillers, gamblers, thieves, card players, card sharpers, ladies of easy virtue. On all these classes Damien waged continued warfare, they demoralized his flock and led them astray. Very naturally the debauched and dissolute objected to be interfered with, and when attacked turned their guns on the attacker. Damien was a good fighter, like all Belgians, and held his ground; sometimes the combat was equal, sometimes unequal and Damien had to retreat, he bided his time and returned to attack as defiant and undaunted as ever.

When the dissolute and debauched element got the worst of the battle they craftily begged for forgiveness, assumed an air of repentance and reform, and bided their time, which came when Damien absented himself from the Settlement to attend to his parishoners' spiritual welfare on Kona side of Molokai.

THE ENTIRE ISLAND OF MOLOKAI HIS PARISH

The whole of the island of Molokai was included in his sphere of work, and not alone the Leper Settlement.

The Catholic Mission was shorthanded for years and could not spare another priest for the district of Molokai, outside the Leper Settlement; hence the work devolved on Fr. Damien, and he put as much energy and zeal into his work there as he did at the Leper Settlement. He succeeded in erecting several churches on the leeward side of Molokai, doing most of the carpentering and painting with his own hands. He also found time to visit the remote and semi-inaccessible valleys of Wailau and Pelekunu, and minister to the spiritual wants of the people there.

In his report to the Board of Health in the year 1886, Fr. Damien relates the conditions in existence at the Leper Settlement at the time of his arrival in the year 1873. (Page 211.)

DAMIEN'S LEPROSY NOT CONTRACTED ON THE
ISLAND OF HAWAII

It has been stated, and the story is still existent, that Damien had contracted leprosy on the island of Hawaii before he went to the Settlement, and his going there was a necessity, not choice. Not a particle of reliable evidence has been or can be produced to support this contention.

I visited Kohala, Hawaii, (Damien's field of work prior to his leaving for Molokai) in June 1889, and made special inquiries on this point as to whether Damien showed any signs of leprosy; those questioned had heard some vague story bearing out the statement, but definite and reliable evidence was not forthcoming, the general opinion was, "that no visible signs of leprosy existed on Damien's person when he took his departure for Molokai."

During the years 1888-89 I resided at Hilo, the headquarters of the Catholic Mission on the island of Hawaii, and while there I acted as physician to Fr. Charles Pouzot, the venerable head priest of the mission, where he had worked and toiled for nearly fifty years. Questioning all the members of the mission on this same subject of "Fr. Damien being affected with leprosy," no evidence could be produced to support any such contention.

HIS ONLY SHELTER—A PUHALA TREE

Fr. Damien having no home or accommodation when he landed at Kalaupapa, took up his abode under the branches of a



HALA TREE.

Similar in appearance and size to the tree at Kalawao under which Fr. Damien slept when he arrived at Kalawao, 1873. Puhala and Lauhala are names also used to describe this tree.

Puhala tree (Screw Pine or Pandanus) at Kalawao, contiguous to the site of the present church, no other shelter being available, except an empty room in a house occupied by lepers, which did not appeal to him. Now, had Damien maintained the same attitude towards contact with leprosy throughout his period of residence at Kalawao as he did on his arrival (when he declined to live in a room where lepers lived), the history of Damien, "the martyr priest of Molokai," would in all probability never have been written.

NIGHTS OF BLEAKNESS AND DISCOMFORT

The Puhala tree generally and by preference selects rocky ground to germinate, its aerial roots and their surroundings afford a choice nidus for centipedes, scorpions, ants, mosquitoes, roaches; and fleas carried by mangy cats, dogs, and sheep, who seek shelter from sun, wind, and rain under its branches.

As if all this is not enough, sleep at night is also interrupted by tree rats and noisy chattering birds, such as the mynah and sparrow, and roosting poultry.

I once was compelled to spend the night under the spreading branches of a Puhala in the district of Puna, Hawaii, whilst I did not have all the vermin companions I have enumerated, I had some of them and hereafter would always advise any traveler or wayfarer not to camp under a Puhala tree.

Yet, under all the discomforts I have mentioned, Fr. Damien began and carried on his work at the Leper Settlement.

COMPARISONS OF "CONTAGION EXPOSURE"

Twenty-five years ago amongst the Hawaiian race the average duration of a case of nodular or tubercular leprosy was eight or ten years, and of the neural form ten to twelve years.

Amongst the foreign lepers, nodular leprosy ran a more prolonged course, with a minimum duration of ten years.

The visible active stage of Fr. Damien's leprosy began towards the end of the year 1884; he died of the disease April 15, 1889, the apparent duration being only four and a half years.

The true duration of his disease was between ten and eleven years, for during the summer of the year 1878, whilst acting as assistant superintendent of the Settlement, true prodromal symptoms of leprosy manifested themselves, to wit, chills, osteal pains slight swelling and tenderness of the joints, slight irregular fever,

tingling, numbness of the extremities, supersensitive and painful sensation in patches along the extensor surface of the upper and lower extremities; all of which signs, even in the absence of skin lesions, clearly indicated primary infection of Damien's system with leprosy. After about five years of intimate contact with lepers (from the year 1873 to year 1878), he suffered the before mentioned symptoms.

AN UNCHARITABLE ASPERSION

In a previous chapter on the subject of "Inoculation," I have stated that a widespread opinion exists, even in lay and professional minds, that leprosy is spread by inoculation, and solely by that means. This unproven and untenable assumption has caused the greatest anguish of mind to many unfortunate lepers of our race. They are unjustly accused of having acquired leprosy through clandestine sexual intercourse with some female leper, without a particle of proof that leprosy can be so acquired.

Even in this twentieth century in Hawaii, I regret to write, the Ghost of Immorality stalks abroad, haunts the footsteps of the unfortunate leper, and if he is sensitive and refined, adds untold misery to his hard lot.

In previous pages I have patiently endeavored to enlighten the advocates of inoculation and teach them that "penile inoculation by chancre or otherwise, is not responsible for the spread of leprosy from INDIVIDUAL to INDIVIDUAL, but that CONTAMINATED food is, also contact with the leper's mouth, unless the CONTACT (male) or CONTACTEE (female) is IMMUNE by reason of NON-RECEPTIVITY of the SYSTEM, or CAREFUL CLEANLINESS.

I have reason to believe that the unfortunate Damien was spared the torment and distress of even suspecting that his infection with leprosy would be attributed to immorality. Be this as it may, when it first became publicly known that Fr. Damien had leprosy, some such accusation of his acquiring the disease by immoral acts must have leaked out. The matter was abruptly brought to my notice in the early part of the year 1885 by a certain prominent physician who visited the Leper Settlement at that time.

On or about May 7, 1885, this certain physician stated to me whilst we were eating breakfast: "Dr. Mouritz, Fr. Damien will come to the dispensary at Kalawao at 10 o'clock, I want you to be there, we can then see how his leprosy is progressing. I

also wish to specially examine him for evidence of other diseases. We will make a thorough examination." I assented.

In due course and at the appointed time Fr. Damien arrived, serene and undisturbed. When asked to disrobe, he readily consented; we found sufficient proof that he was undoubtedly a leper, but nothing more.

We searched his mouth, throat, and cervical glands, also carefully scrutinized his entire person and found absolutely NO TRACE of any other disease. This event happened nearly thirty years ago, but the details are fresh in my memory; strange to say the "victim" of our examination did not display any resentment, and did not seem to realize the important bearing the discovery of any incriminating evidence might have on his future.

Fr. Damien possibly realized that the syphilis-leprosy theory which was then hypnotizing a certain portion of the popular mind, might be invoked in connection with his acquiring leprosy, he well knowing that syphilis can be inoculated innocently and accidentally, no question of morality intruding itself in such a case.

The contact of Damien with leprosy was always careless and reckless during the few years I was connected with the Settlement. I never hesitated to scold him and lecture him, because it set a bad example to other non-lepers.

PROLONGED AND INTIMATE CONTACTS

Mother Superior Marianne, and some of the Sisters have had prolonged and intimate contact with leprosy, both at Kakaako and Molokai, for a period over thirty-two years, and they are free from leprosy. "The Immunity of Cleanliness" is their guardian and protector.

Mr. Joseph Dutton has had the same class of contact as the Sisters for nearly thirty years, night and day contact, week in and week out, year in and year out, but I never knew or heard of the Sisters, the Rev. Mother, or Mr. Dutton eating from the same dish with other lepers.

From the date of Fr. Damien's arrival, May 10, 1873, to the time of his death, April 15, 1889, is a few weeks less than sixteen years (some twenty-five days less).

Mother Superior Marianne and some of the Sisters spent five years at Kakaako detention hospital, and have passed over twenty-seven years at the Bishop Home, Kalaupapa; in all a total of over thirty-two years, almost double the contact and exposure that

Fr. Damien was subjected to, but the venerable Mother and Sisters are free from leprosy. The same statement applies to Mr. Joseph Dutton, who has lived continuously at Kalawao since July, 1886, nearly thirty years, under conditions of prolonged and intimate contact with leprosy—he is also free from the disease.

The late Fr. Wendelin lived nearly fourteen years at Kalau-papa, exposed to the same risks of contagion as Fr. Damien, but up to the time of his death in Honolulu, September 1, 1914, he showed no signs of leprosy.

Fr. Wendelin took only the ordinary precautions that any prudent man would to avoid leprous infection; on the other hand, Fr. Damien took no precautions whatever. In the kindness of his nature, he never forbade lepers entering his house, they had access to it any time, night or day. I named his house "Kalawao Family Hotel and Lepers' Rest," free beds, free board for the needy; this designation I believe could not be improved on, it exactly fitted the daily prevailing conditions. In marked contrast was the attitude of Frs. Albert and Wendelin towards lepers who came to see them and ask for aid, neither of these priests admitted lepers to their private apartments, visiting lepers were received on the lanai or in their studies, the leper visitor stated his business briefly and departed.

A MODEST REPORT

In his report to the president of the Board of Health in March, 1886, Fr. Damien gives only a modest and limited insight into his self-chosen, dangerous, and arduous work amongst the lepers; what he does not mention are the following vital facts:

His house stood in close proximity and to the LEE side of the burial ground connected with his church, in this said burial ground over 1,000 leper corpses were buried. Owing to the rocky nature of the ground in some places, the corpses were not regularly distributed, in places two, three, and four coffins were placed on top of each other, naturally the soil became over saturated with the soluble products of the corpses, and the percolating rain drowned the maggots and other grubs; hence decomposition went on very slowly, the surrounding air being filled with foetid and foul vapors emanating from these semi-decomposing corpses, and to add to the gruesomeness of the surroundings, the closeness of the coffins to the surface of the ground encouraged the visits of scavenger dogs and pigs, and by these animals rooting and disturbing the graves, the odor around Fr. Damien's home was similar to a

charnel house; but such vital conditions essential to good health as pure air, did not worry the priest.

Forty years ago leprosy in Hawaii, in its advanced stages, was very much more severe and loathsome than it is today; also when the leper arrived at the Settlement his disease was of many years' duration, his tenure of life was very brief; hence there was a high annual mortality. In the seventies the smallness of the leper houses and absence of ventilation made the foetid breaths, the smell from the foul ulcers of the dying and semi-putrid cadavers so nauseating that it sickened the strongest stomach. Here worked Damien night and day, living and sleeping in this polluted, foetid atmosphere; cheerful, careless, and care-free. In addition, his food cooked and handled by a leper; his clothes washed by a leper, even his pipe smoked by a leper when he (Damien) carelessly laid it aside—not once but often—and so surrounded by a multitudinous aggregation of disease-producing conditions "that his escape from leprous infection would have been marvelous, and even miraculous."

The resulting climax came about; Fr. Damien succumbed, fell a victim to the dread "Incurable Destroyer," and passed on to his reward. His own view on becoming a leper was, "If Providence sees fit to afflict me with the leprosy whilst I am working amongst the lepers, I will gain a Crown of Thorns, whether I am worthy or not."

The brief period of five months elapsed between the arrival of Fr. Wendelin coming to aid Damien and the latter's death. Fr. Wendelin arrived in November, 1888, Damien died in April, 1889

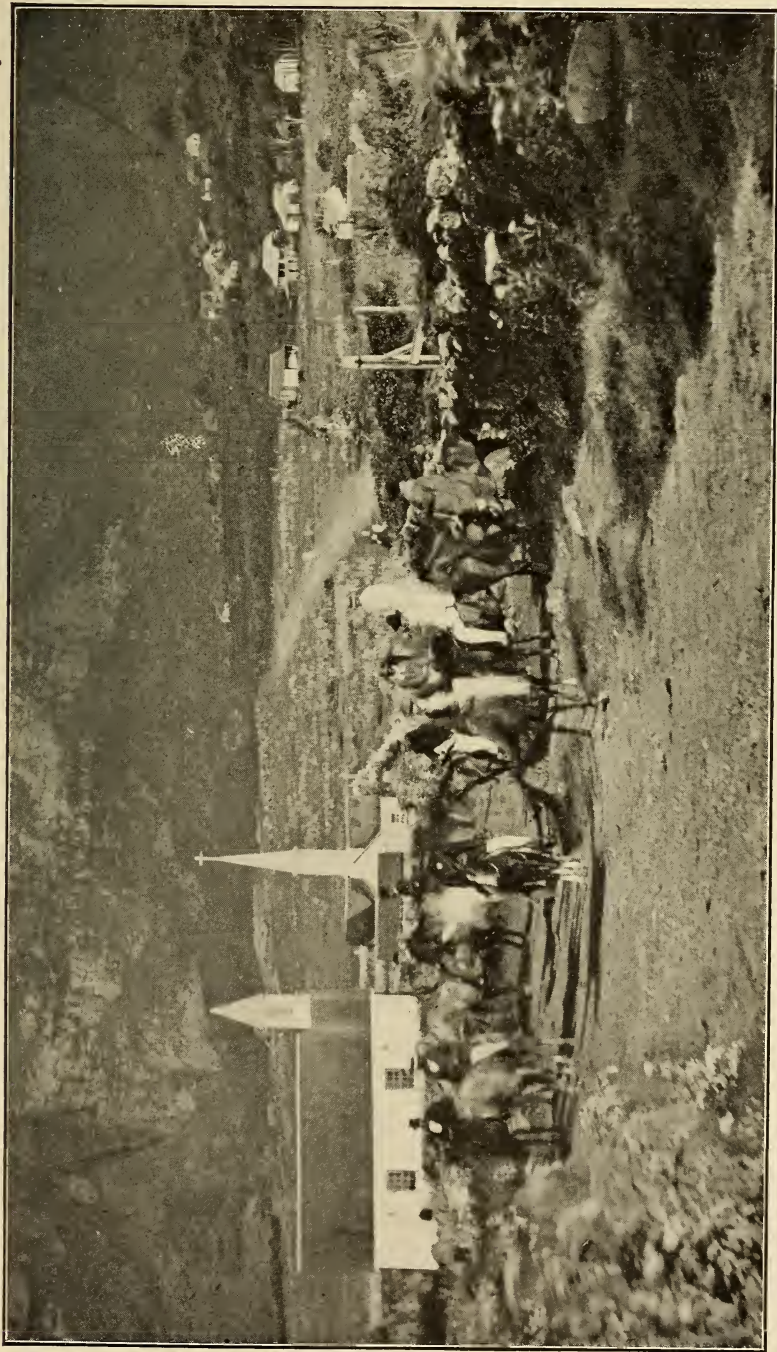
OPPOSITION TO DAMIEN

Several writers who have given to the world what purports to be a history of the life of Fr. Damien, have commented on the fact that hostile opinions were held about the priest in the village of Kalawao, the scene of his earthly labors. This is nothing remarkable; quite a minority of the residents were opposed to the ways and the work of the priest. This opposition and non-appreciation of the man came in the main from two sources:

A. The non-members of the Catholic Church; this opposition was not personal, it was in fact only friendly rivalry.

B. The dissolute and debauched Hawaiians and a few foreigners. This opposition to Damien was personal, and highly slanderous.

(a) Fr. Damien was a most zealous, untiring worker on behalf of the Catholic Mission, and everything pertaining to the



VIEW OF KALAWAO, MOLOKAI, A. D. 1884.

The church in the foreground is the Protestant church of "Siloam," Pastor Rev. J. Hanaloa. The church with the steeple and cross is the Catholic church, Fr. Damien's, erected by Brother Bertram in the spring of the year 1872, and dedicated May 30 of the same year to "St. Philomena" by Fr. Raymond Delalande; much enlarged and remodelled by Fr. Damien himself in after years. The present church has been much changed since Fr. Damien's decease. It has now a tower in place of the previous steeple.

welfare of his flock, and his policy, fulfilled in every sense, and was an exponent of the short, pithy expression, "The end to be obtained justifies the means or method used." He was always planning and devising schemes to extend the power and membership of his church. Beginning with a slim church attendance and scant funds, Damien worked quietly and persistently until the Catholics had a membership of two-thirds of the lepers, and in worldly riches they had double the property of either the Protestants or the Mormons.

On another page I have stated the pastor of the Protestant Church at Kalawao was a native Hawaiian, Rev. J. Hanaloa, aged, semi-blind, and burdened with a leper wife. The average native Hawaiian pastor, with a FEW exceptions, has not the training, ability, or energy to compete with a foreign priest or pastor of any denomination.

As assistant pastor, where a Hawaiian is braced up, he makes good; but others who have full charge of a parish are not always competent to fill that position. This statement should be taken as no unkind reflection on the Hawaiian minister; the material from which a stable and efficient ministry can be built up is not obtainable in a few decades of civilization.

The Catholic Church, in its wisdom, has never invested with ministerial functions any native Hawaiian to my knowledge. The Romish Church has always moved with the greatest circumspection in this matter.

Fr. Damien's active and persistent energy assumed a propaganda of proselytism, his church was filled to overflowing, whilst the other churches were scantily attended.

If the members of Fr. Damien's church failed to attend Sunday services, bright and early Monday morning Damien visited the home of the non-attendant to know the reason, illness alone was accepted as a legitimate excuse.

The native Hawaiian pastor of the Protestant Church, and also the Mormon elder, failed to pursue the same course which Damien did; hence their flocks diminished or remained stationary.

Again, the Catholics owned numbers of houses built by their own funds or willed to the church by deceased lepers. The accommodations in these houses were better than those provided by the Board of Health, inasmuch as they were not overcrowded, they were much sought after, especially by lepers with families, and also by new arrivals.

If the occupants of these Catholic houses failed to live up to the standard of a good Catholic, Damien bounced them out when

they failed to heed his repeated warnings; these ejected parties had to seek other quarters, they became enemies of Damien and joined the ranks of the opposition and waged a secret verbal war against the militant priest.

(b) Some pages back I mentioned that Damien fought the makers of distilled liquor, the drunkards, card players, gamblers—in short, the dissolute and debauched element. Quite naturally, they fought back, aided and abetted by some of the foreign lepers; but they signally failed to defeat Damien. They spread around stories abusing him and accusing him of lax relations with certain women, but their statements were too absurd, scandalous, and malicious to carry any conviction of their TRUTH. (See page 226, attacks the “hula” and raids on liquor makers.)

When the unfortunate priest fell a victim to leprosy the element hostile to him in the Settlement pointed to this fact as corroborative of the truth of the charges they had made, but they overlooked one particularly significant condition, which was this, *The very women whom Damien's name was connected with, were some of the cleanest in the Leper Reservation; they were kokuas or helpers, were non-lepers, never became lepers—I know from personal observation they were not affected with leprosy at the time of their death.*

During the time I was connected with the Leper Settlement, I had free access to Fr. Damien's rooms at all hours, both night and day—on the priest's premises there were no locked doors or screened windows.

In the year 1878 Damien acted as assistant to Sumner, who then held the office of superintendent of the Settlement, and he (Damien) informed me, “that he had, and was glad to, resign the office, owing to the fault-finding and the continuous complaints made against him.”

All of which goes to prove that no matter how unselfish and self-sacrificing the priest may have been, even to losing his own life, yet he encountered opposition and made many enemies.

Fr. Damien's intense zeal, unflagging energy carried him over many difficulties, but a long residence at the Leper Settlement had tended to make him overbearing, dictatorial, autocratic; he brooked no interference in his own affairs, but was continually interfering in matters that did not concern him. His frequent intrusion upon the duties of R. W. Meyer, manager of the Settlement, caused disputes, hence strained relation existed between them at frequent intervals.

As for myself, I often had to tell the priest in no uncertain tone and language, "I want no advice nor interference; mind your own business, attend to your own proper sphere of work, to wit, the spiritual welfare of the lepers; do not listen to the tittle-tattle and inane gossip of the Settlement."

* * *

THE AVERAGE THINKING MAN will be safe in concluding, when he looks back and contemplates the fading track of past years, that since Fr. Damien's departure HENCE, from the scenes of his earthly labors, he suffers no discomforts, neither sorrow nor pain; because the former things have passed away.

If we are to believe that charity and kindness cover a multitude of sins, and also the doctrine of "Justification by our Works," who is prepared to deny that sixteen years of privation, hardship, and disagreeable work, nights of watching and answering calls to the sick and dying at all hours, vigils and many weary hours passed in the night and darkness by the bleak and inhospitable shore at Kalaupapa, awaiting the homeless leper and ORPHAN—all this work must surely count, and it is amply sufficient to win salvation for Damien.

PASSING PLEASURES

Leprosy and the Leper Settlement had not always a gloomy side, at times jokes and good humor abounded. The laughter-loving, light-hearted and pleasure-seeking Hawaiian is not easily moved to despair of the future; hope that the morrow will be no worse than today is every present.

Fr. Damien at times joined in frolics with the "kids," skip the rope, tag me not, hide and go seek, "buff" the blind man, etc., were all entered into with childish glee.

The days of his boyhood, and the nature of the work he had been engaged in in his youthful days showed itself, and came to the front in his delight watching the taming of unruly cows and unbroken colts. Poultry raising was also one of his great relaxations, he had a great number of hens and chickens and abundance of eggs, which were always at the disposal of the sick, whether they were Catholics or not.

The late Charles Warren Stoddard in his little book, "The Lepers of Molokai," describes the scene: "The priest, calling his chickens to be fed, hens and chickens flew from all quarters of the Heavens, alighting on Damien's head and shoulders or anywhere

they could obtain a foothold, fighting and struggling to reach the dish (which held the food) in his hands." This scene occurred in the month of October, 1884, when Stoddard and I visited Fr. Damien.

Damien enjoyed a joke, was quick at repartee, and was fond of teasing. He once came upon me when I was walking in his churchyard at Kalawao, he asked my business. I answered: "The filling of the coffins with quicklime would be as efficient as cremation." Damien remarked: "It would be a good thing, but are not doctors quite proficient in filling coffins, without quicklime?" I laughed at this sally, bided my time; it came a few days later. Damien made the statement, "the Sisters, if some could be spared from Kakaako, would greatly aid the lepers." I assented, but insisted that the time was inopportune, that he (Damien) would speedily become too exalted and proud; quite naturally, he resented the remark and asked me to explain. I answered, "whenever a Sister or nun comes you (Damien) will have no equal." He then asked me "why not?" and I replied, "when the nun arrives, Fr. Damien, you will have no equal, because you will be second to NONE." He was slow to see this *jeu de mots*, but when he did perceive it, it made him shake with laughter.

One subject, it appeared to me, Damien was always pleased to discuss. He was imbued with certain lofty ideas and believed in the possibility of their future realization—the Leper Settlement to be a special diocese, Damien to be vicar-apostolic, with special powers direct from the Pope, and the work of the whole Settlement to be carried on under strict ecclesiastical lines, like a monastery. R. W. Meyer took delight in teasing Damien on the possibilities of this scheme panning out, and would often say, "Father, how soon shall we see you with shaven poll and tonsure, assuming this will mark your new order." Damien would laugh heartily and refuse to be drawn out.

One other matter, and I will finish this chapter. I have never seen any other priest, doctor, or other contact, assume the same careless and indifferent attitude towards infection with leprosy as Fr. Damien did, save and except Dr. Fitch.

If Fr. Damien was uncleanly, it was often from necessity, not choice, for how can a man wash his hands before eating when there is no water to wash with? Even during my stay at the Settlement, water was a scarce commodity, and for days and days the pipes contained no water. This was to be expected with a reservoir head of sixty feet and only a one-inch and a three-quarter-

inch pipe for main delivery, extending a mile and one-half, up and down, over small hills, with broken couplings, leaky pipes and numerous faucets. No spare fittings were kept in stock, extra couplings, T's, elbows, reducers, and faucets were conspicuous by their absence.

Fr. Damien was a jack-of-all-trades, but carpenter work was his mania and recreation. He did good work, his good physical development enabled him to work for hours with little fatigue. Bath tubs, window and door casings were his specialty, and were at the disposal of all.

THE PROGRESS OF DAMIEN'S LEPROSY

Whilst the incipient symptoms of Fr. Damien's leprosy were plainly visible in the year 1884, the disease made slow progress, and followed the usual course that hundreds of other cases have done at the Leper Settlement.

About the month of October, 1885, his disease began to take on renewed activity, and the typical manifestations of leprosy became very prominent. Nodular deposits in the right ear became extensive, the cheeks, lips, forehead, and chin showed marked infiltration, and rapid alopecia of the eyebrows and other hairy parts became very pronounced. About the month of March, 1886, I wrote to Bishop Herman, head of the Catholic Mission, on the desirability of Fr. Damien proceeding to Honolulu and taking the Goto treatment of hot baths and other medicines, which was then in vogue, very popular with the lepers, and said to cure the disease.

The Dr. Goto treatment is carried on in Japan and is of long standing; it gives relief to certain symptoms of leprosy, fails to effect a cure, is very expensive to carry out in Hawaii, Dr. Goto having a monopoly of the drugs used. In many cases where the heart, lungs, spleen, and kidneys are much implicated, its effects are positively harmful; great loss of weight and emaciation occur, the patient presents a semi-asphyxiated appearance, marked lividity of the skin and mucous membranes taking place, indicating destruction and elimination of the haemoglobin of the red blood corpuscles, and puckering and crenation of these bodies; under these conditions asphyxia livida is produced, due to excess and defective elimination of the carbon dioxide in the blood.

Some of the lepers expressed themselves as deriving great benefit from Dr. Goto's treatment. No doubt in properly selected cases hot bathing is beneficial, but hot baths three times a day for an hour or more, exhaust the strength of the average leper. Se-



FR. DAMIEN, A. D. 1887.

In the grasp of the DESTROYER—two years previous to his death.

lection of proper cases for any routine treatment is the office and work of the trained physician; haphazard and indiscriminate selection must end in disaster and failure, no matter what treatment is pursued. The same suit of clothes will not fit everyone, nor is the same suit of clothes suitable for meeting the changing conditions of the weather every day of the year.

In due course Bishop Herman answered my letter, wrote to Fr. Damien to come to Honolulu, all arrangements being made for his sojourn at Kakaako hospital. Fr. Damien went to Honolulu, but within two weeks returned to the Leper Settlement, stating he felt homesick for Kalawao, had to remain idle in Kakaako; but meanwhile he had learnt all about the carrying out of Dr. Goto's treatment, would establish his own bathhouse at Kalawao and another for the boys and girls at his home. He did nothing, however, until almost the end of the year 1886. Meanwhile every mail brought him alleged cures for leprosy from all over the world, to what extent he used the multitude of medicines sent him I do not know. If he did use them it made no difference in the progress of his leprosy, which rapidly advanced, and with remarkable severity. At the beginning of the year 1887 the skin of the abdomen, chest, and back, both extensor and flexor surfaces of the arms and legs showed tubercles, masses of infiltration, deep maculation in varying degrees of extent and severity. The mucous membrane of the nose, palate, roof of the mouth, pharynx and larynx became involved; the skin of his cheeks, nose, lips, forehead, and chin became excessively swollen, deep copper-colored macules and deep infiltration alternately prevailing; his body became emaciated.

Early in the year 1887 Fr. Damien was able to get the much-talked-of Goto bathing and medicines established at Kalawao. He proceeded immediately to demonstrate his belief in the treatment by excessive use of both medicines and bathing, using hot water at a temperature of 108° , and remaining in the same for hours; drinking a tea of the nature of a semi-bitter tonic, *Aesculus Turbinata*, is part of the treatment, and also a handfull of herbs is used in the bath, supposed to dissolve in the water and liberate medicinal properties, together with all this, a teaspoonful of pills weighing about 2 grs. each, is also partaken of daily. After a few weeks of vigorous use of this Goto treatment, it had the effect that I have already stated, giving Fr. Damien a semi-asphyxiated appearance, symptoms of aphonia and dyspnoea showed up; he tottered in his walk, his clothes appeared like bags hung on his figure, the

lobes of both ears became enormously enlarged, reaching to his collar. Bronchial catarrh, oedema of the feet completed the train of grave symptoms; yet, in the face of this evidence of the unsuitability of the Goto treatment for his case he claimed it was doing him good, and he felt better than he had been for the past two years. He lost at least thirty-five pounds in bodily weight at this time. About the month of June, 1887, many of the lepers began to drop off the Goto treatment, this also influenced Fr. Damien, and he dropped the hot bath part of the treatment to one bath every other day, but the mischief had been done, and his system refused to respond and he grew weaker.

THE BENDING OF THE OAK

In September, 1887, it became apparent that Fr. Damien had given up all hope of getting any relief or stay of his leprosy, his weakness became apparent to himself; the slightest exertion brought on difficulty of breathing; his temper, which previously had been alternately cheerful and irritable, became preternaturally calm, and permanent gloom settled down upon him.

His face, although dreadfully and distressingly disfigured by masses of leproma and general leprous infiltration, showed unmistakable signs of grief and anguish, (this despair and anguish a condition of mind quite common amongst the victims of leprosy) came upon the suffering priest at recurrent intervals in two forms:

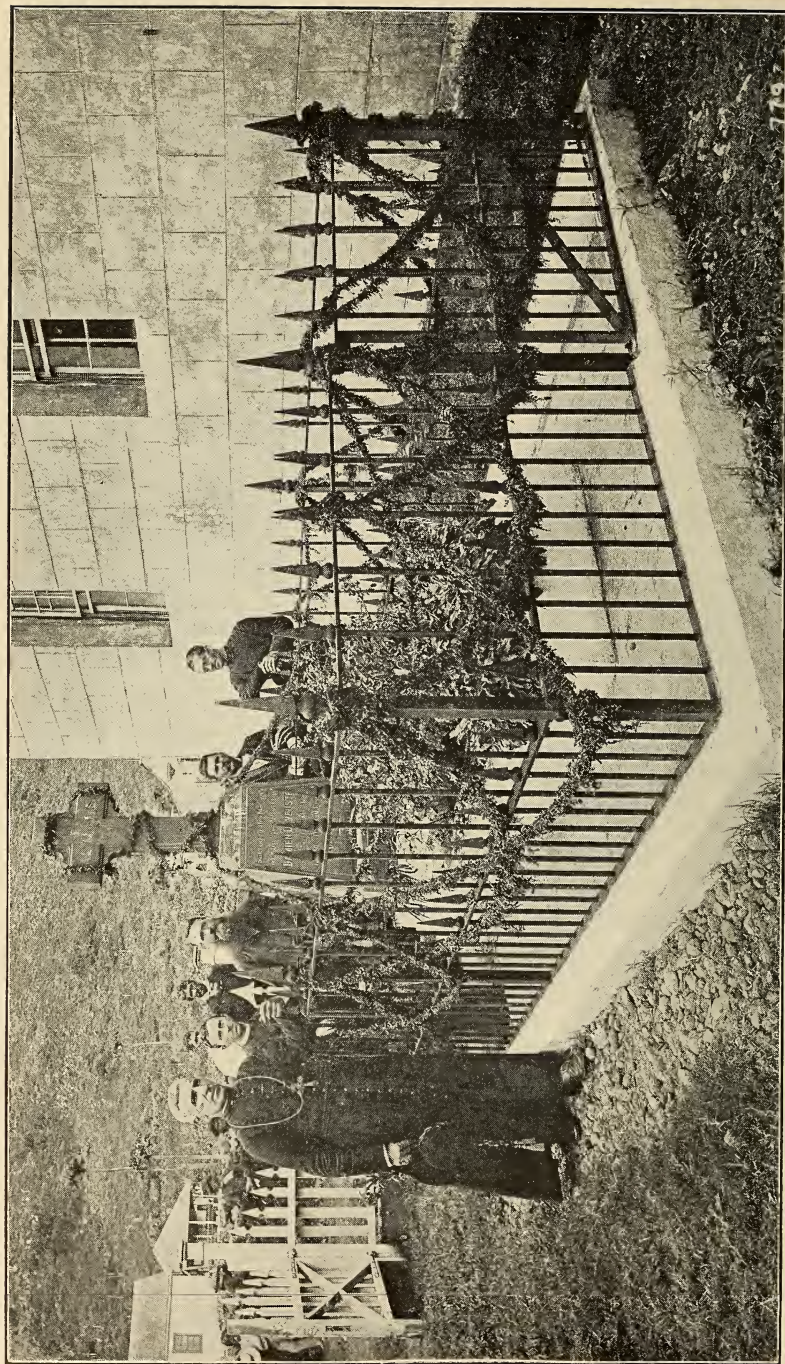
First.—“*Melancholia Attonita*,” where he remained motionless and silent, with his eyes looking fixedly into space.

Second.—“*Melancholia Religiosa*,” strange to say, occasionally troubled him—THE DELUSION OF HIS BEING UNWORTHY OF HEAVEN. This was most remarkable, for if there was any man in the universe who had every prospect of future happiness and salvation, that man was Damien.

One constant worry was ever present also in the mind of the dying priest; it was this: “Who will look after my poor orphan boys and girls when I am gone?”

The question has often been asked and variously answered, “why was not another priest sent to help and relieve Damien of his work?” The answer is, “even if a priest had been sent to his assistance, Damien would not have relinquished his work; he preferred to struggle on to the end and die working in harness.”

He stuck to his work and he even appeared to me to work harder as his strength gradually became sapped by the disease. I



THE TOMB OF FATHER DAMIEN.

He died of nodular leprosy, April 15, 1889.

The figure in front, left—Bishop Gulstan. The figure in front, right—Fr. Wendelin. The figure behind cross—Fr. Conrady.

departed from the Leper Settlement in the month of January, 1888. Damien's death was then plainly in sight. His stomach had become gravely involved; he suffered constant gnawing pain, continuous sensation of hunger, nausea, heartburn, vomiting, syncopal attacks and great depression. Added to other troubles, the leper is affected with a voracious appetite, which causes him to overtax his stomach; this condition is due in part to fibroid changes in the walls of the stomach, atrophy of the circular muscular fibres of the pylorus, together with dilatation; the stomach bolts and rapidly ejects its contents, almost as soon as the food enters, hence the leper feels constant gnawing pains and hunger.

Fr. Damien lived some fifteen months after I left the Settlement. He had resided in Hawaii a few weeks over twenty-five years. He passed away about 8 a. m. on April 15, 1889; this was the Monday before Easter—he had earnestly prayed for death at this season, hoping to greet his “MASTER” on Easter Morn.

* * *

The Catholic Church did not entirely monopolize Fr. Damien or his work amongst the lepers, Protestant and Catholic alike aided him, religious prejudices and jealousies rarely appeared; if they did, they were speedily forgotten and relegated to the background.

In the year 1886 a clergyman of the Church of England, Rev. Chapman, of Camberwell, London, collected \$5,000 from amongst his parishoners and friends. This money was placed in the hands of Fr. Damien without any restrictions whatever and to be put to whatever use the priest saw fit. This gift of £1,000 was a handsome token of friendship and good-will from the English Protestants to Fr. Damien.

Fort Street Church, Honolulu, known as the Missionary Children's, through its members, generously aided Fr. Damien in his work on Molokai. The donations furnished were quietly and unobtrusively given to aid Fr. Damien directly and indirectly and all the lepers.

The missionary children and their descendants were the richest members of the church, and they devoted their wealth to a good cause; helping, elevating, and comforting the last hours of the unfortunate outcast lepers on Molokai, until the Grim Reaper came upon the scene.

FATHER ALBERT MONTITON

The work of the Catholic Mission at Kalaupapa was in charge

of Father Albert, he was Father Damien's assistant and fellow worker amongst the lepers, and had resided at the Settlement for several years, from September 8, 1882, to March 31, 1885, when he left Molokai to take up other work.

Father Albert was French, and at this time, when I first met him, was nearly sixty years of age. He was diminutive in stature, of slender physique and poorly nourished, due to a life of privation, really starvation, amongst the inhabitants of the Paumotu Group of Islands, near Tahiti in the South Pacific. Here he resided for nearly twenty years.

The people of these islands were unfriendly to strangers, and cannibalism was practiced amongst them. When they were not feasting on human flesh; their daily means of subsistence was raw fish and cocoanut, a food utterly unsuitable for a Caucasian.

The effect of the unhealthy climate, impure water and poor food, caused Father Albert to suffer from stomach trouble, dysentery, and a severe skin disease—Inveterate Psoriasis, Diffusa and Gyrata (*Lichen Ruber Planus* in appearance); these bodily ailments caused him to leave the scene of his labors to seek medical treatment in Tahiti.

With very little relief, after months of treatment, he returned to his cannibal parishoners, labored patiently for some more years longer, until extreme illness caused him to abandon his labors.

Father Albert left Tahiti for Valparaiso, Chile, where no treatment benefited his skin trouble. Finally he went to Europe and when he reached Rome, the Pope gave him audience.

Father Albert was placed in the care of the best physician of the Vatican, who treated him for months with little or no benefit. The Pope then sent him to the famous skin specialist of Vienna, Austria, Dr. Ferdinand von Hebra, who, after months of treatment, decided his disease was incurable (probably a form of leprosy), and advised Father Albert to seek a warm climate. Finally, Father Albert reached Honolulu, and was sent to Molokai, where the climate, and a better quality of food than he had been able to procure in the Paumotu, materially improved his psoriasis.

Father Albert's appearance when he first went to Molokai gave the impression that he was a leper; scaly hands, face, and alopecia of the hairy surfaces of the body, also chin, cheeks, and eyebrows. In the month of March, 1884, Dr. Ed. Arning visited Kalaupapa with Princess Liliuokalani (her report is on page 295 of this book). The doctor saw Father Albert (who had now given up all hope of relief from his skin affection), and in

duced him to persevere in the use of the remedies he prescribed; heroic doses of arsenate of soda, and externally, salicylate of bismuth ointment. Under this treatment the psoriasis yielded, and after several months Father Albert's skin assumed its natural state, and he was practically cured of a disease of twenty-five years' existence.

Father Albert though sixty years of age was quite active, and easily took care of the needs and welfare of the lepers living at Kalaupapa and Iliopi. These villages were very sparsely settled, the bulk of the lepers residing at Kalawao.

Frequently he repeated to me his desire to spend the rest of his life at Kalaupapa, because he enjoyed good health and was free from the misery of his companion psoriasis, which possibly might return if he changed his residence. Something, however, came into his life and altered all his previous hopes of permanent residence at the Settlement. He informed me one day in March, 1885, he was leaving the Settlement for other spheres of labor, his disease had left him, and he felt with renewed vigor he could undertake other duties; that Fr. Damien was still hearty and strong and could amply cover the field of work of the Leper Settlement.

Fr. Albert had no signs of leprosy during his residence at Kalaupapa, and left the Settlement free from any taint of that disease. He died in Spain in the year 1894.

* * *

FATHER GREGOIRE ARCHAMBAUX

Father Gregory, a priest of the Catholic Mission, who had lived many years in the Hawaiian Islands, arrived at Kalawao near the end of the year 1887, and resided with Father Damien for about four months.

The Father had undergone all the hardships of poor food and hard work, being located at Hana, Maui, a damp, rainy district, and latterly at Lahaina, Maui. In his time the numerous steep and rocky trails which ran through the various large gulches made traveling arduous and dangerous, especially in the periods of heavy rains and freshets in the rivers, which had to be forded on horseback, no bridges spanning the streams.

Dr. Beratz, a very able and accomplished Austrian physician, was drowned in the year 1871, in one of these streams when in flood. The rainfall in the mountains of the Hana district is very heavy, as much as 300 inches per annum in the Keanae Valley.

Amongst these inhospitable surroundings in a sparsely populated district, Father Gregory passed many years of his life, sleeping anywhere, wherever he happened to be at nightfall—in caves, grass houses, and other homes of the Hawaiians, any place that he could obtain food and shelter.

In these situations he encountered typhoid, small-pox and many cases of leprosy. He slept repeatedly in rooms with lepers, and had to EAT the food of the family, which practically means contaminated with bacillus leprae.

Father Gregory was affected with incipient NODULAR LEPROSY. He was French, nearly six feet tall, of powerful build, complexion dark and swarthy, he had abundance of black, wavy hair, and a remarkable thick and long growth of eyebrows, which his leprosy had not yet begun to diminish. He had been pronounced a leper by a board of examining physicians, and came to the Leper Settlement with the object of remaining there permanently and aiding Father Damien.

Besides leprosy, Father Gregory suffered severely from asthma, and posterior spinal sclerosis, taking the form of "Lightning Shocks," affecting the muscles of the lower extremities, which at times brought the Father to his knees involuntarily, and sometimes with ludicrous explosions from the onlookers.

His leprosy gave him very little inconvenience, but the copper-colored macules and infiltrations caused him visually great annoyance, hence he vigorously applied sublimate of mercury in strong lotions—60 grs. to a pint of Eau de Cologne—in hopes of eradicating the aforementioned skin troubles, but he only succeeded in creating centers of traumatic eczema, which, when healed, left the skin more red and copper colored than it had been before the sublimate lotion was used.

Both the macules and the small, slightly elevated areas of infiltration were devoid of sensibility and failed to sweat; these two conditions being almost pathognomonic of leprosy. Mercurials and iodides produced no effect, so there was no question of the nature of his disease, because syphilis is the main cause of locomotor ataxia or posterior spinal sclerosis, and has symptoms resembling leprosy and may even be present complicating this disease.

During the few months Father Gregory stayed at Kalawao, his asthma was much aggravated, and his appetite and strength began to fail rapidly, and I suggested a return to Kakaako. Father Damien also thought it best, because Father Gregory was unable to perform any service, and was an added burden to him (Damien).

Father Gregory was only too pleased to return to Honolulu; the Board of Health raised no objections, and shortly after the Father left Kalawao for Kakaako, where his asthma and nervous disease became gradually worse, and he died there Nov. 12 in the year 1888.

He had often been connected with the Leper Settlement, acting as temporary priest for many years.

* * *

FATHER CHARLES POUZOT

Father Charles, the venerable priest in charge of the Catholic Mission work at Hilo, Hawaii, was well on to seventy years of age when I became his medical attendant in the year 1888. He had ministered to the spiritual wants of his parishoners in the Hilo district for well nigh forty years.

North of the Wailuku River, which runs through the town of Hilo and empties itself into Hilo Bay, the climate is rainy, almost resembling the Hana district, where Father Gregory was located. South of the Wailuku River, the climate is less rainy. Hilo town has a rainfall of about 15 inches a month.

Father Charles, like most Catholic priests in the country districts fifty years ago, led a hard life, visiting the sick and dying at all hours, irregular meals and poor food were his lot; rain-bound, he frequently had to eat and sleep with Hawaiians, who are always hospitable and at times too kind for their own good.

Father Charles had stomach trouble and suffered repeated attacks of acute indigestion, with lurking appendicitis, but I discovered a more interesting condition in the course of a clinical examination, to wit: specific neuritis affecting the nerves of the left forearm and hand, due to leprosy, which was quiescent and had aborted, but it had left marked atrophic changes in the muscles, the typical hollow between the thumb and forefinger was there, defective sensibility of the hand and skin of the forearm; there were also atrophic changes in certain areas of the body, higher in color than the neighboring skin, and insensitive; thermo-anaesthesia and symetrical enlargement, or bulbing of the ulnar nerve above and below the elbow joint completed the picture. As usual, the atrophic invasion of neural leprosy had confined itself to its favorite seats, the interossei, thenars and extensors of the hand.

Father Charles, unlike Father Gregory had never visited or had any connection with the Leper Settlement. The acquiring of leprosy by these two priests tends to show that a healthy person

is exposed to contagious foci of leprosy outside of Molokai, and inasmuch as the cases of leprosy are lurking, or may or may not be detected, there is a certain element of greater risk, because the danger is unexpected and a person is caught off his guard.

* * * *

FATHER ANDRE BURGERMANN

Father Andre, who spent many years at Lahaina, Maui, and also had charge of leeward Molokai, and paid transient visits to the Leper Settlement, was another priest who had symptoms of leprosy neuritis, almost identical with those of Father Charles Pouzot.

In addition, Father Andre had ataxic symptoms, and the "Lightning Shocks," similar to Father Gregory, together with incoordination, disturbances of sensation, and loss of reflexes. He was well on to sixty years of age when I observed his condition in the year 1894.

The suspicious changes in his left hand were caused by neural leprosy, which had aborted, as it very frequently does in this location.

Father Andre did have intimate contact with leprosy at the Leper Settlement, and lived at Kalaupapa from July, 1878, to July, 1880.

The acquiring of leprosy by these four Catholic priests, Andre, Charles, Damien, and Gregory, all Europeans, is fairly conclusive *that leprosy is contagious, that it spreads from individual to individual, and a de novo development cannot be maintained.*

IN MEMORIAM

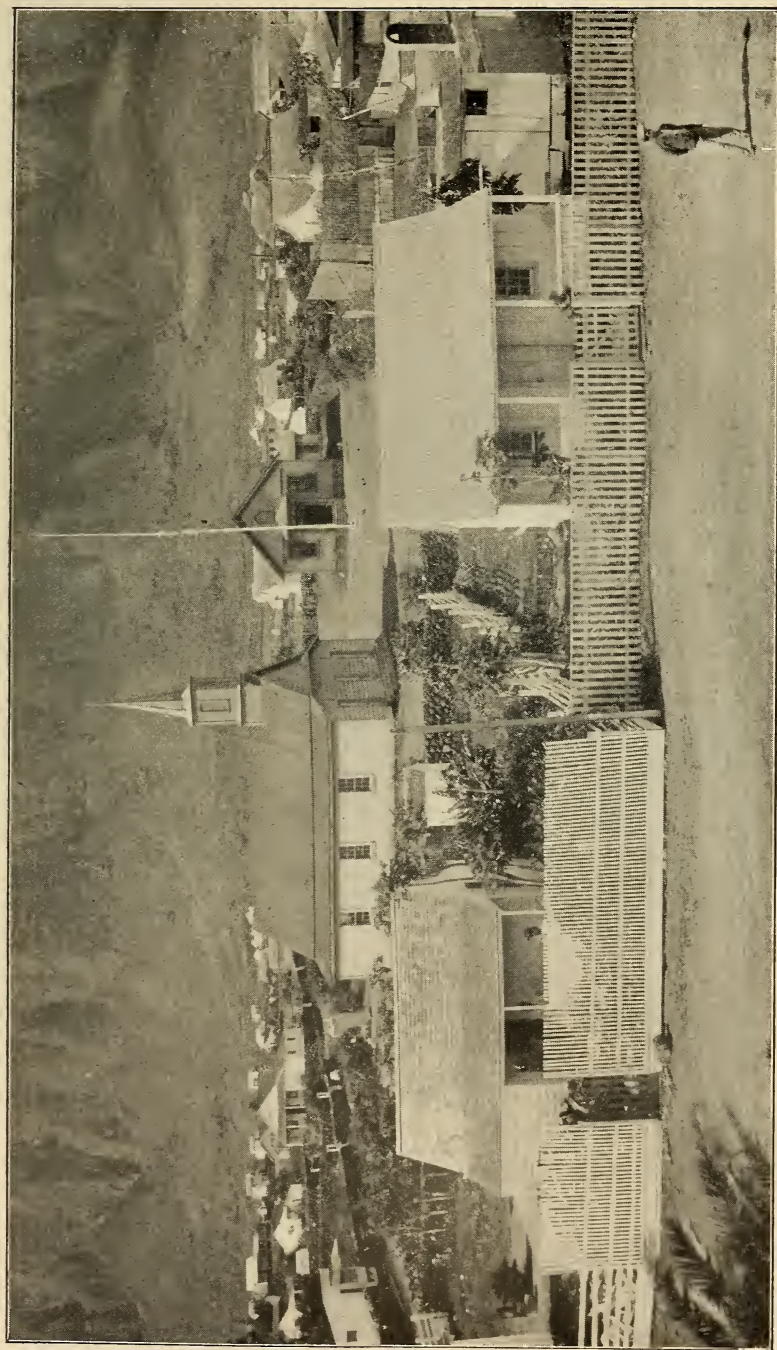
FR. WENDELIN

"Now I lay me down to sleep,
I pray the Lord my soul to keep."

Entered into rest at the Catholic Mission premises, Fort street, Honolulu, Father Wendelin Moellers.

He fought the good fight, and passed away on September 1, 1914.

He was born on March 21, 1850, near Münster, Westphalia, Prussia, and was the youngest of six children. At the time of his death he was in the sixty-fifth year of his age. He studied for the priesthood at the University of Louvain, Belgium, and was



KALAUAPAPA.

Fr. Wendelin's field of work.

ordained priest in the year 1878. His first sphere of work was at Tahiti and the Marquesas Islands, where he labored for seven years. He came to the Hawaiian Islands in the year 1885, and was placed in charge of the district of Koolau, Oahu.

HE GOES TO DAMIEN'S AID

Owing to the rapidly failing health of Father Damien at the Leper Settlement, Father Wendelin was sent to his relief in the month of November, 1888, and he remained at the Settlement until October 9, 1902, nearly fourteen years; during all these years he labored nobly and did excellent work, the mantle of Father Damien falling on Wendelin's shoulders after Damien's decease, at whose obsequies he officiated.

During Father Wendelin's term of office and under his splendid administrative ability, the churches, the schools, the Baldwin and Bishop Homes reached a high degree of spiritual efficiency, also the general religious work of the Settlement went on apace; all of which progress would have delighted the heart of Father Damien, had he then been living.

In Father Wendelin's period of residence at Kalaupapa, marked changes and improvements took place. The lepers had better housing, and their material comfort was vastly improved, an abundant supply of water was brought into the Settlement from Waikolu Valley, the conditions of sea transport were much changed for the better.

Special personal work of Father Wendelin was the building of St. Francis Church at Kalaupapa, a large and handsome building destroyed by fire on August 12, 1906.

DOES NOT CONTRACT LEPROSY

Father Wendelin was eminently just and upright, plain spoken almost to bluntness, no taint of scandal ever tarnished his name, he was most abstemious in his habits and endured the life of privation and toil that falls to the lot of most Catholic priests. He was exposed to the same risks of contact with leprosy as Father Damien, but the FELL DESTROYER never infected him. Father Wendelin spent fourteen years at Kalaupapa in intimate contact with leprosy, and after leaving that land of SORROW he lived twelve years longer, but never a trace of the disease showed itself.

In appearance he was slim of build, stood about five feet six inches tall, had a very small head, his gestures, walk and speech



"RAPID FIRE" WENDELIN, COOLING OFF.

A. D. 1910. Sixty years old.

were rapid and full of action—he was playfully called “Rapid Fire” Wendelin—his temperament was of the typically nervous type. He weighed about 140 pounds.

GIFT FROM THE LEPERS

When Father Wendelin took leave of his leper parishoners, they performed a most pathetic and touching deed. The poor and needy lepers with stinting and saving, raised enough money to procure from Paris a gold chalice of exquisite workmanship, which they presented to the departing priest as a token of their love and esteem. The subscribers were not confined to the members of the Catholic Church, the other churches also contributed.

The last twelve years of Father Wendelin’s life were spent at Lahaina, Hilo, and Honolulu from February, 1909, to the time of his death.

To me personally this Catholic priest was especially attractive. He was an able debater, his arguments were clear and incisive, if they were not absolutely convincing; it was impossible to cut them down clear to the base, there remained a snag or stump that was impregnable. Prussia, of course, is the dominant state of the German confederation, and the peculiar racial traits of the Prussian showed themselves in Father Wendelin, and explains his clash with the Board of Health.

He possessed a charming freedom of speech and expression, remarkably rare in a Catholic priest. He spoke and wrote what he thought was right, and signed his name, no beating and stabbing behind the back; deceit, guile, and chicanery found no dwelling place within him. In these modern days of insipid mediocrity, debates and discussions with Father Wendelin were highly illuminative and entertaining.

OVERWORK CAUSES BREAKDOWN

He did not spare himself, with the never failing result—his health gave way—hurried and scanty meals, irregular and interrupted hours of sleep began to tell their tale, stomach trouble showed itself, then heart starvation, next irritable heart and tachycardia, next organic heart disease, muscular degeneration, and finally came dilatation of the left ventricle with thinning of its walls; all these changes occurred slowly; later shortness of breath, then the decision, “I must see a doctor,” but it was too late. Father Wendelin had reached sixty-three years of age, and rebelled



FR. WENDELIN AND HIS CLASS.

A. D. 1910.

against his physician's orders to rest; hence the mischief done to his heart could not be stayed or repaired.

THE SWEEP OF THE REAPER

During the summer of the year 1913, the cardiac symptoms began to trouble him, shortness of breath on very slight exertion and excessive heart's action, all these symptoms gradually increasing until March, 1914, when other grave symptoms occurred---anginal attacks, lung engorgement, and temporary thrombosis of the pulmonary artery. During the last few days of April, all the indications pointed to his speedy death, but under the skilful treatment of his physician, Dr. St. D. G. Walters, he improved, finally taking to his bed May 1, 1914. June, July, August passed, Father Wendelin's death being expected on five different occasions, so alarming and continuous were the anginal attacks. After three days passed in a semi-comatose condition, the end came on September 1, 1914, and he passed quietly away to his reward.

Dr. Goldsmith's lines, written in the year 1770, are a fitting tribute to Father Wendelin's life:

"To relieve the wretched was his pride,
In his duty prompt at every call,
He watched and wept, he prayed and felt for all.

Beside the bed where parting life was laid,
And sorrow, guilt, and pain; by turns dismayed,
The Reverend Champion stood. At his control
Despair and anguish fled the struggling soul;
Comfort came down the trembling sinner to raise,
And his last faltering accents whispered, praise.
At Church * * *
Truth from his lips prevailed with double sway,
And fools, who came to scoff, remained to pray.

His people's welfare pleased him and their cares distressed;
To them his heart, his love, his griefs were given,
But All his serious thoughts had rest in Heaven.
As some tall CLIFF, that lifts its noble form,
Swells from the vale, and midway leaves the storm,
Though round its breast the rolling clouds are spread,
ETERNAL sunshine settles on its head."

In the year 1888, Bishop Herman desiring to send another priest to aid Fr. Damien, addressed a circular letter to all the eligible priests of the Mission, asking them if they were willing to go to the Leper Settlement.

Some of the priests gave favorable answers, some pleaded unfitness, some made no reply. Fr. Wendelin gave his answer in a few words: "My answer is our rules," which was tantamount to stating, "I obey my Bishop, and will go where he orders me to go." Fr. Wendelin was chosen.

During the last year of Fr. Damien's life a strange event took place; the coming to the Leper Settlement of Fr. L. Conrardy from Oregon. He came at the special instigation of Fr. Damien, who acted against the wish of Bishop Herman; the affair was very displeasing to the bishop and the priests of the Mission. Fr. Damien was stubborn, self-willed and refused to listen to any remonstrance; he determined to have his own way and acted accordingly.

Fr. Conrardy was of a different order of priests from those of the Catholic Mission in Hawaii. He remained seven years at the Settlement, and later he labored amongst the Chinese lepers near Canton. He died at Hong Kong, August 24, 1914.

The Conrardy affair might have developed into a very unpleasant situation, but it was smoothed over and mollified by the tact and diplomatic finesse of Fr. Wendelin.

THIRTY-ONE YEARS AN OFFICIAL OF THE LEPER SETTLEMENT

I have previously related that one R. W. Meyer held the position of agent of the Board of Health and superintendent of the Leper Settlement. He resided at Kalae, a locality immediately above the steep sides of the Kalaupapa pali, which, at the trail of Kukuihapuu, reaches an elevation of 2,200 feet above the sea, which ebbs and flows directly at the base of this mountain.

The late Charles Warren Stoddard in that entertaining and pathetic little book, "The Lepers of Molokai," admirably describes the difficulties of ascent and descent of the palis adjacent to the Leper Settlement; the angles of elevation in various parts of the old trails, such as Stoddard described in the year 1884, vary from 30° to 90°, the average angle of ascent is steep, about 40°.

Meyer had a long record of service, holding the position of superintendent of the Settlement from its inception in the year 1866 to 1897, when he deceased. He had resided on the island of Molokai some forty-seven years, coming to Hawaii from Australia, to which country he had emigrated from his birthplace, Hamburg, Germany. He was well educated and wrote and spoke fluent English, came from a good family, had the average German characteristics—stolid, level-headed, a clever thinker, and a stickler for obedience to his will and discipline.

Meyer had an estimable Hawaiian wife, Kalama. His attitude towards the Hawaiians and treatment of them, whether they were lepers or not, always gave me and many others the impression that he was a little harsh and severe in his dealings with them; he judged them by a too high standard. Living on an isolated island like Molokai, Meyer's continual association with inferiors, mentally and socially, made him very arbitrary.

During Meyer's tenure of office the clandestine travel up and down the Kukuihapuu trail was kept to a minimum, permits to visit the Leper Settlement were held up if they showed the slightest informality; a hawk's eye was kept on all the traffic passing by his gate, which was located on the road to the Settlement; all this very much conduced to efficient segregation.

For the several years I was connected with the Leper Settlement, there was one everlasting growl and complaint about its management, and the source of trouble was centered on Meyer, but in justice to the man, I must add most of the growls, kicks and fault-findings were unjust and frivolous. To give satisfaction,

to please and placate the numerous and varied collection of lepers, the holder of the office of superintendent would require to be of the type of the Archangel Gabriel, and even then dissatisfaction would exist. I know all this from personal experience.

Sick people, the world over, are fault-finding, complaining, fretful, irritable and discontented. Those who are in constant contact with the sick, expect to meet with all this trouble, and the Leper Settlement furnished a full quota of chronic growlers from amongst the various races in segregation.

R. W. Meyer paid quarterly visits to the Settlement, spending a few days there, a period of time, the lepers decided, was much too brief to be of any real service to them; an absentee official was not to their liking.

Meyer mostly depended on the reports and the conditions outlined therein, furnished by the deputy superintendent. When complaints were made to him (Meyer) personally, by the lepers about poor quality of food and its insufficiency, leaky houses, poor quality of the blankets and clothing supplied from the local store, shortage and irregular distribution of oil, soap, and matches, and a multitudinous variety of other complaints, Meyer returned an invariable grim stereotyped answer. "You are well treated; compare your present condition and circumstances with what you had to put up with before you came here. Here you have nothing to do, have beef, poi, rice, salmon, hard bread, sugar, all supplied in liberal quantities. What more do you want? Your complaints are most unreasonable and unnecessary." The growlers would ease off for a little time, and then begin anew with renewed ardor.

All physicians connected with the Leper Settlement prior to my taking office, were invariably unjustly criticised and subjected to unkind and sarcastic comments by Meyer, whose dislike of doctors was considerably augmented by the severe criticism on the management of the Leper Settlement made by Dr. J. H. Stallard, of date March 13, 1884, in a special report to the late A. S. Cleghorn, then a member of the Board of Health.

A. S. Cleghorn, husband of Princess Likelike, sent Dr. Stallard to the Leper Settlement to investigate the truth and circumstances calling for the continual complaints coming from the lepers, concerning "shortage of their rations, suffering from cold due to insufficient personal and bed clothing," and many other troubles.

Dr. Stallard in his report criticised, strongly arraigned and severely censured the management of the Settlement, which stung Meyer, and he answered Stallard in kind. The shortage of beef

and other food shown up by Stallard was only too true, and Meyer's answer failed to change the merit and justice of the complaints of the lepers. (Dr. Stallard's report will be found in another part of this work.)

The continual complaints and troubles connected with the unsatisfactory management of the Leper Settlement ultimately reached a climax.

In the month of February, 1886, I was ordered to report at Honolulu at my earliest convenience, and when I did so, I was urgently requested to take over the entire management of the Settlement.

I promptly declined the office, having troubles enough as the physician of the Settlement. I did not care to butt into a hornet's nest and take further responsibility. In those days of political bitterness and factional strife, holding government office was no sinecure.

The next year, in June, 1887, there came a change in the government and its officers, due to a bloodless revolution.

Later on when a new Board of Health assumed office (and manifesting real or apparent hostility towards me), it gave me a sufficient loophole to resign my position as physician to the Leper Settlement and the island of Molokai, an office I had never sought, and reluctantly accepted; but I gained experience in leprosy, which repaid me for many discomforts and troubles.

REPORT OF R. W. MEYER

Superintendent and Agent of the Board of Health at the Leper Settlement, Molokai, April, 1886.

REMARKS BY THE SECRETARY OF THE BOARD OF HEALTH

The accompanying report of Mr. Meyer, agent of the Board of Health at the Leper Settlement, in reference to the Settlement, is very interesting, in so far as it gives a somewhat connected view of the condition of things at the Settlement since its establishment, by one who was connected with it from its inception; but as Mr. Meyer has not been an actual resident, but has lived some ten miles distant, and only paid occasional visits to it, say once in three months, he has not had the fullest opportunity to observe the condition of affairs, or to aid in carrying out every reformation that has or might have been carried out, or of accurately noting the various changes that have been made. Therefore, Mr. Meyer has not dealt minutely with some of the most interesting events in the history of the Settlement at regards the phases of leper life, such as the Lepart, Walsh or Ragsdale management, when the last named was practically a king among his fellow sufferers, and holding in his will the power of life and death; nor to the labors of the resident physicians, from the days of Drs. Emerson, Neilson, and Fitch, to those of the present active incumbent, Dr. A. Mouritz. Information on these several points will, however, be found more fully set forth in other portions of this general report.

REPORT

*To His Excellency Walter M. Gibson,
President of the Board of Health.*

Dear Sir: In presenting my report of the Leper Settlement for the past two years, I am led to reflect upon the great difference existing in the comforts and ease enjoyed by the lepers at the Settlement of today, when compared with the first few years of its establishment, now just twenty years ago. It may, therefore, not be amiss to recite briefly the history of that time, as it shows a constant endeavor on the part of the government to improve the condition of these unfortunate people, and as I have been connected with the affairs of the Settlement ever since the very commencement (1865-66), I am in a position to speak from personal knowledge.

Leprosy had already existed on the islands for about twenty years before it seriously attracted the attention of the government, and even then the nature of this disease was poorly understood, and the great magnitude of the calamity was not realized, excepting by a few men of the medical profession, who urged the necessity of segregation as being the only means known through which this terrible disease had been stamped out in other districts, and it was justly hoped that segregation here would lead to a similar favorable result; and it probably would have done so, had it been possible to rigidly enforce the segregation of lepers, even as late as the time when the law of segregation was enacted (1865), for the known cases of leprosy on the islands at that time were comparatively few.

The present site of the Settlement, which was established in 1865, was deemed to be the most suitable spot for the isolation of the lepers on the islands, one-half of it being bounded by an almost vertical mountain wall, from 1,800 to 2,000 feet high, and the other by a deep sea, with a precipitous shore, excepting only in two places, one at Kalaupapa, and the other near Kalauwao, where in good weather boats can make a landing safely.

The tract of land constituting the Leper Settlement projects from the main body of the island, and forms a kind of shelf, including probably an area of about 5,000 acres, abounding with every variety of soil, and everything necessary to supply the wants of natives (fruits, taro, potatoes and many other vegetables can be grown here to perfection), and leaving a large area of land to be utilized for the raising of stock; the sea abounds with fish, and before this place was occupied by the lepers, it sustained a very large and thriving population.

Unfortunately the place is not well watered. There is, however, on the eastern boundary of the Settlement a considerable and never failing mountain stream in the valley of Waikolu, which is about a mile, or a trifle more, distant from Kalawao. There are other springs in the valley of Kalawao, and one or two in the valley of Waihanau, but all at considerable distances from the habitations. These springs, however, during very dry times are subject to suffer diminution of water, and the one at Kalawao at such times is liable to dry up.

It was thought at that time if such a place as above described was given to the lepers, where they could live unmolested, they might, with the assistance of some of their families, make comfortable homes for themselves, without incurring much greater ex-

penses to the government than the cost of collecting them together, giving them an outfit of clothing, a few other necessities, and the transport to the Settlement. And such of these unfortunates who were known to be possessed of means, and who had not managed to place them in the hands of friends, in such a way that they could not be got at, had to pay them over to the government as a reimbursement for expenses incurred in their behalf.

The original inhabitants of the place owned a great many pieces of land and houses, the houses being mostly thatched ones, and only three or four were wooden structures; the lands were mostly planted with taro, potatoes, and other vegetables. Most of these houses and lands were purchased by the government for the accommodation of the lepers, and the planted lands for their support.

All the first shipments of lepers were allowed to take their wives and husbands with them, or a son, and in some instances a daughter, but children were not permitted to accompany them.

The Board of Health bought for future use for the Settlement some young heifers, a few horses, one or two pairs of oxen, and a cart for the use of the lepers, and they were expected to obtain their living from the growing crops, to take care and re-plant them and live there precisely in the same way as natives do in any settlement on the islands.

Unfortunately, segregations proceed slowly, and six months or more had elapsed from the time of the vacation of the place to the time of the arrival of the first shipment of lepers, and when they arrived they found the cultivated fields overgrown with weeds, and they had very hard work to save enough to eat for themselves. However, they managed it, commenced to like the place, and got along very well until after considerable intervals one or two more shipments of lepers arrived.

No food was given these people excepting what the first comers were willing to give them, which was not much; they were willing to work for themselves, but not for others, and the first trouble arose through it. Fortunately, the place was overrun with a native pear, and natives had lived on this fruit previously, and these beans supported them till the Board concluded to furnish these people with food for a sufficient length of time to enable them to raise their own; but that time, with many, never arrived; finding that they got food any way, they made no efforts to work for themselves, and supplies had to be bought. And many really could not work, their hands and feet being too sore. It was also



KING KAMEHAMEHA IV.

Husband of Queen Emma.
Founder of the Queen's Hospital, A. D. 1860.

* * *

Born February 9, 1834. Died November 30, 1863.

found that they could not obtain sufficient fish or meat for their support, and they received from the Board small allowances of salt beef or salmon. They were allowed three pounds of meat and one bundle of paiai per week, and nothing else. Some became destitute of clothing, and this was supplied them annually, and only to such as had no means or friends. The men received each a pair of blankets, a denim frock, a pair of pants, a hat, and some of them shoes. The women also a blanket, a shirt of blue or brown cotton, and a calico dress; with this they were expected to get along for a whole year.

For a considerable time there was nobody to look out for these people, a man was sent there just to receive them, show them the houses, and give them their weekly allowances of bread and paiai.

As already stated, water was scarce, and had to be carried considerable distances, and it may be imagined great inconvenience and considerable suffering arose from it.

It was but natural that troubles also arose between them which led to quarrels, and, as there was nobody to settle these matters, they had to do it themselves the best way they could. Many of them were approaching the latter stages of the disease, and those who had no friends or relatives with them suffered more or less; but I must say, to the credit of these people, that, as a rule, they almost always found a friend in their extremities. There was no hospital or building in those days where they could be taken care of.

It became necessary to appoint a superintendent, and an elderly gentleman (Mr. Walsh), with his wife, was sent to the Settlement to fill this position. This gentleman having been an officer in the British army, was accustomed to discipline, and he tried his best, and succeeded to a certain extent, to bring some system and order in the affairs of the Settlement. A hospital was erected, the building still standing, and the worst cases were taken there under the immediate care of the superintendent and his wife. Food was prepared for them, and they got other things, such as a little bread, rice, some tea with sugar, and as by this time the heifers had become cows, there was some milk for them also; thus really for a time considerable suffering from want of attention was relieved. Unfortunately, the superintendent and his wife did not understand the Hawaiian language, and many of his endeavors to establish rule and order were not understood by the people, and constantly little troubles arose between him and the people, and they became as discontented as ever. The poor man fell sick and died, and his widow became superintendent; as assistant, an

old sea captain was sent up, but these two could not agree—neither of them could speak with the people, and matters did not improve; and, in addition to these troubles, the lepers did not receive their full allowance of meat, which was only three pounds per week. It culminated in the discontinuance of the foreign superintendents, and natives or half-castes were tried, and, as experience has proven, with the best results. Natives are perfectly willing to submit to considerable pressure, even oppression, if it comes from one of their own people, but not from a foreigner.

It was often difficult to supply the Settlement with food, especially during the winter season, when the landings are bad; an attempt was therefore made to cultivate the valley of Waikolu with taro, and manufacture the paiai on the spot. This business was undertaken by agents of King Kamehameha V in 1870; the valley was leased to them at the regular market price. Agents were appointed to prosecute the work, and, I am sorry to relate, that some of these agents, in their anxiety to please the King, took away from the lepers all the taro patches they had cultivated for their own use without the least remuneration. One poor leper alone lost twenty patches. Of course, this proceeding put a stop to any future cultivation of lands by the lepers and their families. Thus matters continued at the Leper Settlement without material changes till the death of Kamehameha V (in December, 1872), when, with the ascension to the throne by Lunalilo, a new Board of Health was appointed.

Segregation was held by the new Board to be the only means of arresting the progress of the disease, and the most energetic efforts were made to effect the isolation of lepers, and without regard to person. Lepers were no longer allowed to take their wives or husbands with them, and visits to the Settlement ceased to be permitted, excepting only under the most strenuous circumstances, and only for a brief interview.

The injustice of claiming the means possessed by lepers was at once discontinued; and in the instances where it had been collected, mostly from the poor widows, it was refunded to them. The wants of the lepers were considered, and their weekly rations of meat increased, and they were also allowed a greater variety of food, and henceforth received five pounds of meat, or if they wished, three pounds of salmon per week; also one bundle of paiai containing twenty-one pounds, or, if they wished, either ten pounds of rice or seven pounds of bread or flour, and five pounds of salt per month.



QUEEN EMMA.

Wife of Kamehameha IV.
Foundress of the Queen's Hospital.

* * *
Born January 2, 1836. Died April 25, 1885.

A little labor was considered to be beneficial and even necessary for the lepers; and, to encourage them to cultivate the lands again, they were allowed the choice to receive the cash value of their weekly supplies of food in lieu of the food itself. This arrangement, subsequent experience has proved to be of great benefit to the lepers as well as to the Board. The lepers managed to cultivate more food than was necessary for their own use, and during winter months, when it was difficult to bring food from adjacent valleys, there was a supply at hand which was bought from the people at the regular market price; thus many of them obtained means to supply wants which were not filled by the Board. Some accumulated money enough to build houses and surround themselves with other comforts, and all without costing the Board one cent more than it would have done otherwise, and it was really rather a saving.

The difficulty of giving the lepers an annual supply of clothing caused it to be discontinued, and, instead of it, a store was established containing every variety of staple goods, to be sold at less prices, only with sufficient advance to cover the expenses of its management and attendance; and such lepers, instead of receiving clothing, were given a bill to the amount of six dollars, for which they could draw at the store what they wished, and these bills were given out just before the commencement of winter on the 1st of October. This arrangement has not been unprofitable to the Board, and it has been of the greatest comfort to the lepers up to this day, and in fact, it would be impossible to do without it.

The great bulk of food consumed at the Settlement has chiefly been purchased from the people living in the adjacent valleys of Pelekunu, Wailau, and Halawa, and from there it was mostly brought by the planters to the Settlement in their own boats, subsequently in boats belonging to the Board, and by men hired for that purpose. As already has been said, during the winter season it is at times impossible for boats to land, and food cannot be landed. To meet this difficulty, a stock of provisions—bread, flour, and chiefly rice—has to be kept on hand to be used in such emergencies.

The valley of Waikolu, which forms a part of the Board of Health lands, seemed to offer the means to obviate all the difficulty, and another attempt was made to cultivate the same. A contract was made with the male friends, or relatives of the lepers living at the Settlement to cultivate this valley for three years. They were to plant, take care, and prepare the taro, and deliver

it to the officers of the Board; and they were to receive as remuneration one-half of its market value. This plan promised to work well in the first and part of the second year; but the people got tired, and when the three years were up they were unwilling to continue the work, and it was given up again.

Besides lepers there existed, and still exists, a large number of people, males and females, who had been allowed to accompany the lepers during former years. Most of these, having no other homes, found the place a very likely one, where they could make an easy living, chiefly obtained from the lepers. To prevent the too great increase of these people, as well as to discourage idleness, the old time-honored Hawaiian rule of "poalima" (fifth day) was established, and which was then in force all over the islands. It simply consists in that every able-bodied male has to give one day's labor per week to the Board, and in turn they were allowed to enjoy the privileges the land affords—precisely the same as the lepers, with the exception, however, that they receive no rations for either food or clothing. To this rule, being accustomed to it, all cheerfully consented, and it has been kept up strictly until recently, but the rule has not been abolished.

A limited number of these people called *kokuas*, or assistants, are absolutely necessary to live at the Settlement, for the performance of the work connected with the slaughtering of animals, receiving and distribution of food, preparing food and providing fuel, local police, messengers, etc.; but all those regularly employed are exempt from the *poalima* rule, and, in addition, they receive food rations from the Board.

Hospital accommodations were increased, and bedsteads furnished to the inmates instead of their being compelled to lie on the floor or mats, as heretofore.

Water pipes were laid on from the spring in the Kalawao gulch to the hospital, with intermediate taps for the use of the people living all along the road, which relieved them of the great burden of going for the water and carrying it considerable distances, and they also had more water.

When His Majesty Kalakaua ascended the throne (in 1873),* most of the gentlemen composing the Board of Health under Lunalilo, with the exception of the president, remained in office for some time, and matters continued to go on very much the same way as under Lunalilo. * 1874—Author.

The number of lepers at the Settlement had increased by this time to about 800, and, in spite of all their efforts to effect their

isolation, numbers always remained behind. Want of sufficient means was probably the cause that segregation was enforced only spasmodically.

By this time the biennial Legislature evinced more interest in the condition of their unfortunate fellow-men at the Settlement than had been the case previously, and at nearly every session a committee was appointed to visit the Settlement and report on their modes of living, sufficiency of food, houses, etc., of the lepers; and, in consequence of one of these visits during the Legislature of 1878, of which committee Your Excellency was chairman, the Settlement received the special attention of the Legislature, which resulted in an increase of their weekly meat rations from five to seven pounds; a number of cottages were also erected, and the lepers received additional necessary articles, such as soap and kerosene oil, and their allowance of ten pounds of rice was change to nine pounds, with one pound of sugar.

Previous to this, the Settlement had received very little medical attention, a physician used to come from Maui, two or three times a year, visit the Settlement for a few hours and return. Subsequently, efforts were made to obtain the services of a resident physician, the Legislature having provided an appropriation of \$10,000 for a physician for the Leper Settlement, which has met with varying success.

By this time, 1886, all the grass houses at the Settlement have disappeared and given place to wooden cottages, which are white-washed, inside and outside, twice a year, for which purpose, lime is furnished the people by the Board free of expense to them.

There are now, at the present day, according to a recent counting, in all 327 buildings at the Leper Settlement, which includes all the hospital buildings, dwelling houses, store, store-houses, and drug-shop, and five places of worship, of which two are Catholic, two Protestant, and one a Mormon church. Of these buildings, 109 belong to the Board, partly purchased, little by little, from the lepers, but chiefly built on purpose for their accommodation. The rest of the houses are owned by lepers, built by them at their own expense, and some of them quite handsome ones; they number in all 213 houses.

Most of these houses are of various sizes, and accommodate various members, but they have small rooms, probably more than three or four times the space allowed under ordinary circumstances; all these houses have windows and doors, and thus, as they are but one-story buildings, they have all the necessary ventilation.

There are now many more houses than existed eight or ten years ago, when the number of lepers reached 800 and upwards, whereas, at the present day, there are but 652. From this alone, it follows, that they are more comfortable, with regard to lodgings, than they have been.

The Leper Settlement, with all its houses neatly white-washed, with its churches and other buildings, its surroundings, imposing scenery, certainly presents a very pleasing and cheerful appearance, especially on fine days, when the population turns out.

The lepers are allowed to own horses and they may frequently be seen in large numbers all dressed up and enjoying themselves at their heart's content, some few also have carriages, and they may be seen driving; they have, also, a music band, very creditably managed by one of the lepers. Were it not that these unfortunates carry the evidence of their misfortune in their faces, it would be impossible to distinguish this Settlement from any other of the same size on these islands. It is probably superior to many.

For the lepers who reach the advanced stages of the disease, as well as for those who have no friends, there are now fine buildings, called hospitals; they are wooden structures 46 feet long, by 20 feet wide, and 9 feet high, and for the better ventilation these houses are unceiled and have short chimnies to promote a current of air. There are two rows of bedsteads in these houses at a distance of about 4 feet between each; they are whitewashed at least twice a year, inside and outside, and are kept as clean as it can possibly be expected with the means at hand. There the lepers are cared for, their food is prepared for them, they receive tea or coffee with sugar or milk, and some extras when the case demands it. These hospitals are at Kalauwao, about 2 miles distant from the landing at Kalaupapa, and surrounded with a picket fence enclosing an area of about one and a half acres. The ground in front of the hospital buildings within this enclosure has latterly been converted into a garden, where the inmates, or those who take an interest in it, plant flowers and some vegetables, making the place look cheerful. The hospitals are in charge of a native steward, who, I am happy to say, takes considerable pride in doing his duty well, and to have all the buildings clean, and the wants of the sick attended to. A new cook-house has been built, probably eighteen months ago, and whenever I have seen it, it always was clean and tidy, very different from what it used to be. These hospitals are also regularly washed, and there is really now but very little bad odor compared with former years, when the means of obtaining a sufficiency of water were difficult. The clothing of the inmates is washed by people employed for that purpose. But

in spite of the care taken to make these people comfortable, very few care to go into the hospitals, they do not seem to feel at home there, and the buildings are seldom more than very partially filled; at present there are only 43 inmates; 36 of them are males, and 7 females.

Besides these hospitals there are two other buildings, one for boys and another for girls, which are in charge of Father Damien, and on this account they are in the immediate proximity of his own dwelling-house. These houses are intended for the reception of orphans or children who have neither parents nor friends at the Settlement.

Other children at the Settlement live with their parents or relatives, in the same manner as they do in other places. There are two schools for them, one at Kalaupapa, the other at Kalauwao; the former has a kokua, not a leper, for a teacher; the latter a leper. The leprous and non-leprous children go into the same school, but are kept in separate places in each of these schools. The number of scholars in all are 50, of whom 36 are boys and 14 are girls.

Segregation of sexes has only been attempted with the hospital yard, where the women occupy separate houses from the men; and with the children, living in the two houses in charge of Father Damien.

The condition and behavior of married people at the Settlement appear to me to compare very favorably with other places, and I do not believe that their standard of morality falls below, if any, that of people living in other settlements. Everything is done to provide for married people either separate houses or rooms, as far as the means at hand allow this to be done.

The lepers do not directly receive clothing from the Board, but they receive an order to the value of six dollars annually, for which they receive at the store whatever articles they stand in need of; but I must say that, as they now have no means of earning any money, that those who have no friends to assist them cannot clothe themselves sufficiently for six dollars per annum; and there would be more or less suffering were it not that charitably disposed people, especially the people of Honolulu have occasionally sent such contributions of clothing, etc.; collected by Her Majesty the Queen, which supplied the wants of the needy ones.

Friends and relatives of lepers living on the other islands are permitted to visit the Settlement, and *live with the lepers* for a shorter or longer time, from *one week to a month or more*, provided they produce a permit. (Very lax segregation.—Author.)

For the preservation of law and order, a magistrate has been appointed, who, although vested with the authority of a district

judge, uses his office chiefly as a judge of peace, or peace arbitrator. All difficulties and disputes arising between the lepers are settled in a friendly manner, without expense to either party, and apparently to the satisfaction of all.

With the exception of the one unfortunate case of manslaughter, committed at the Settlement in November last, crimes have been of rare occurrence. Since 1882 there has been but one case of burglary, and during the last two years only one case of attempted burglary. For such crimes, of course, the offenders are punished with imprisonment; but, being sick, the time of imprisonment is made very much shorter than the law really prescribes.

As laws and rules which cannot be enforced had better not be made, it has ever been the endeavor of those having had charge of the affairs of the Settlement to establish as few of them as possible, and only such which years of observation and public opinion at the Settlement made and approved. These rules, therefore, are few, but the following of them have been the means of preserving the peace.

Each leper has the right to select a building spot wherever he pleases, provided the place is not essential for purposes of the Board of Health, and he is therefore required to notify the superintendent. Each leper on arrival at the Settlement has also the right to select the family or company he desires to live with, provided, however, they do not object to it. If they object, he is given a place with others who are not adverse to it.

Lepers building houses at their own expense, have the right to sell those houses again to other lepers, for lepers to live in. All houses built by lepers at their own expense, therefore owned by them, are, nevertheless, considered to be under the control of the Board, if to assert such a control, for good reasons, should become necessary.

Lepers trusting one another with money or other things must do so at their own risk, nothing is done for them, officially, by any officer of the Board.

Claims against deceased lepers for services rendered during their last illness are respected, if testified to by the leper before death and in presence of the chief officer of the Settlement; and if his heirs do not pay the disputed amount, his property, if he leaves any, is sold and sufficient of the proceeds is paid for such services.

The property of a leper who dies without heirs at the Settlement or assigns, is sold by the sheriff of the Board and the proceeds are forwarded to the president of the Board of Health, and the death of the leper is advertised in the papers that his heirs

may come forward and claim what he left. Wills left by lepers are also carried out by the Board, provided they are satisfactorily made out and properly witnessed.

Drinking intoxicating beverages is forbidden, and persons found drunk are punished with twenty-four hours' imprisonment.

Making intoxicating drink from potatoes or ti root is likewise prohibited and punished, and all material used in making the same is confiscated and destroyed.

Liquor for the use of lepers and kokuas is not allowed to enter the Settlement, and suspicious looking packages when they come ashore are opened. If liquor is found, it is confiscated and destroyed or sent to Honolulu to the marshal, to whom opium, if found, is also sent.

Gambling is also forbidden at the Settlement, and guilty persons are punished.

For the kokuas, the same rules are applied with some additional ones.

Every able-bodied male kokua gives one day's labor to the Board per week, for which he enjoys all the privileges and benefits of the place.

Kokuas deserting their leprous wives or husbands, on whose account they were permitted to live at the Settlement, are told to leave.

Kokuas repeatedly guilty of disorderly conduct or gross immorality are likewise ordered to go.

Every kokua can leave the Settlement when he pleases, but he cannot return without a special permit from the president of the Board of Health.

Kokuas guilty of crimes or misdemeanors, are tried according to the laws of the Kingdom.

These are, substantially, all the rules which have thus far been observed at the Settlement, and, with the exception of the unfortunate occurrence last November, already mentioned, affairs have gone very smoothly during the past period.

During the past twelve or fifteen months the lepers have had a much better opportunity to avail themselves of medical attendance, than they have ever had before, having had the services of a resident physician during the greater portion of this time.

The live stock now running on the pastures belonging to the Leper Settlement consists in 235 horses, 288 mares, and 74 colts—in all, 579 horses; 40 cows, 18 steers, 25 heifers, 10 working oxen, 1 bull and 25 calves—in all, 119 cattle; 20 jackasses and 3 mules—

in all, 23; making a total of animals of 739 head now running on the land.

Suggestions for further improvement of the condition of the lepers and additional comforts, I have but few to make.

Since the discontinuance of allowing lepers the choice of receiving the cash value, in lieu of their weekly food rations, many of them have become rather poor; they do not plant as much as they used to, as they cannot sell their produce; it ceases, with them, to be an object to raise it.

I beg, therefore, to recommend the re-establishment of the system of giving them the choice to receive either the food itself or cash in lieu thereof, besides providing means as much as possible to enable them to earn a little money, such as by raising potatoes and purchasing them again, as used to be done for the supply of the hospital, and others who very often prefer them to paiai, rice or bread. They will then be able to supply themselves with some additional clothing and other necessities, for, as already said, "six dollars per annum" is insufficient to clothe anybody. It does not cost any more to give them cash in lieu of food, rather the contrary, and were it only practicable to adopt the plan of giving them all cash in lieu of food and meat, it would very much simplify the management of the place and be less expensive.

Whilst I do not wish to deny the desirability of laying a larger water pipe, and extending the same to Kalaupapa, I must say that no absolute necessity for it exists, but should means be at hand and permit it to be done, I would recommend that it be done. And in that case, I would still advise obtaining the water from an abundant and unfailing source, by which Kalauwao, Makanalua and Kalaupapa and the entire Settlement can be supplied at once, for almost any desired purpose, than to obtain the supply from springs which are too much dependent on our irregular and uncertain rainy season, even should it cost a little more.

I would also recommend the erection of a new slaughter-house, the present one is getting old and in a place where it is difficult to be kept clean, and put in a place where it can be supplied with water from the pipes, and save the expense of carting the same.

Furthermore, I consider it an advantage, when providing the Settlement with beef-cattle, to obtain a larger number at once; (orders to send cattle to the Settlement to fatten on the pastures, have repeatedly been sent to Meyer.—Secretary Board of Health),

sufficient, perhaps, to last three months, that they may derive some benefit from the extensive pastures.

As a rule, cattle lose in weight for the first two weeks after being landed, owing to change of place and pasture, but will soon regain what they have lost, and probably add considerably to their weight.

To the request, what my experience and observations during these years of intercourse with lepers and others have taught me, relating to the contagiousness or uncontagiousness, heredity and causation of leprosy, I will give the result, which may be taken for what it is worth.

"In the face of so much evidence of its spreading in so short a time as it has done on these islands, it is hard to conceive how anybody, professional or non-professional, can doubt the communicability of leprosy. It is simply the extreme slowness of its action and development, the apparent immunity from it, which so many seem to possess, and the imperceptible manner of its communication, which could have led to the conclusion that the disease is not contagious."—Dr. Mouritz.

I arrived on these islands in 1850, and very little, if anything was then known of leprosy. About the year 1857, I first heard of its appearance amongst natives, under the name of Chinese disease, or in Hawaiian, "Mai Pake." It was recognized by the few Chinese then on the islands, and this has given it the name of "Mai Pake" here, and not because it has been introduced here by the Chinese. It is much more likely that it came to these islands through the mixed crews of whale ships, which had negroes, black and white Portuguese, and men of other races, coming from countries where leprosy was, and still is, prevalent.

In about 1859 or 1860, I saw on this island the first case of leprosy; it was a young man, he died with it in less than three years. The young man's mother took care of him, probably, and in 1868, she showed signs of leprosy, and died a leper at the Leper Settlement. I have known these people well, for they lived in my neighborhood. I only mention this one case, although I have account of others. And at the Leper Settlement, whilst there are many cases where people have lived together for many years without showing visible signs of leprosy at present, there are enough who do, and, as I reported before, fifty-two kokuas alone, have become lepers during the past two years, or declared to be lepers, by the physicians attending. Again, a number of foreigners of

various nations—American, English and German—have become lepers.

Is it reasonable to suppose that all these men would have become lepers had they remained at home where they were born? They became lepers, because they came here, to a place where leprosy was prevalent, and exposed themselves to it.

Leprosy attacks the robust as well as the delicate, but it appears that people with syphilitic and broken-down constitutions are more apt to become its victims. That no more foreigners have contracted the disease than they have, is simply owing to their better mode of living and care they take to avoid coming in contact with leprosy, and it may be that they possess a great degree of immunity.

The disease appears to me also to be hereditary, and I will give a short history of a couple, a man and his wife, living also in my vicinity. Both man and wife are strong and hearty looking people, they show no outward signs of the disease, yet their children at the age of six or seven years became lepers one after the other, several of them were taken to the Settlement years ago, and there died lepers, and they have now with them another child, also a leper. How did these children become lepers? The husband's mother died a leper, the wife's father likewise. Is here not reasonable belief that these children were born with the germ of the disease in them, and that it was transmitted to them through their grandparents? Similar cases exist or have existed at the Leper Settlement. Another significant fact is the great number of cases of leprosy existing, where other and older members of the family of such cases are lepers or have died with it.

The cause of the disease appears to me to be more or less speculative, by taking a general view and comparing the same with other diseases, it is not improbable that leprosy is caused very much in the same manner as they are. If it be true that like causes, under like circumstances or conditions, always produce the same effect, or similar effect, it must be evident that all diseases, running a known course, from that visible beginning to the end, must have had always the same origin, each disease peculiar to its kind, very much like the sprouting and growing of seeds of different plants.

What this origin of leprosy or other disease consists in I do not pretend to know; it may be a parasite or organism of an inconceivably small size, which enters the body, and under unknown

conditions develops and reproduces itself until it has taken possession of every part of the body, including the organs of reproduction.

Until the true cause of the origin of leprosy has been discovered, there does not appear to me to be much hope of arresting the progress of the disease or effecting a cure, and no other means can be expected to stem the spread of this scourge than the most merciless and rigid enforcement of the law of segregation. It would prove to be the most merciful in the end. Twenty years of segregation have now been practiced. What is the result? There are as many lepers as ever, more than in the commencement.

Halfway measures are here of no avail, they simply amount to a constant repetition of those heart-rending scenes, experienced by so many, of separating husbands from wives, parents from children, brothers from sisters, and without accomplishing the important purpose of saving the rest of their fellow-men, and for which they were required to suffer, and willingly gave up their liberty.

I am fully aware of the insuperable difficulties encountered in carrying out the law of segregation on these islands, and therefore doubt the possibility of having it carried out to the extent it ought to be.

There is, however, one hopeful sign, the disease appears to assume a milder form, and the number of the very bad cases, of which there were so many in former years, is very much smaller and the disease appears to progress slower.

I have the honor to be, sir,

Your obedient servant,

R. W. MEYER,
Agent Board of Health.

BROTHER JOSEPH DUTTON

Soldier, Trappist Monk, Soldier of the Cross.

Brother Joseph Dutton, of Kalawao, Molokai, the indefatigable worker amongst the lepers during the past thirty years, is a veteran of the Civil War. He was an officer connected with the Army of the Cumberland, and was then known as Lieut. Ira B. Dutton, of Co. "B," 13th Wisconsin Volunteer Infantry, and had a splendid record as a soldier.

He was born on April 27, 1843; his boyhood was passed at Janesville, Wisconsin, and in his youth he displayed the same excellent qualities as he did in the Army, and has done during the past thirty years at the Leper Settlement, Molokai, Hawaii.

In the summer of the year 1861, Dutton enlisted in the then recently formed Co. "B," 13th Wis. Vol. Inf. He served the length of the war, some four and a half years. The record of his army service is as follows:

Quartermaster sergeant, 13th Wis. Inf. to February 10, 1863;

Second Lieut., 13th Wis. Inf., Co. "I," February 10, 1863;

First Lieut., 13th Wis. Inf., Co. "I," February 15, 1865;

First Lieut. and regimental quartermaster, March 24, 1865.

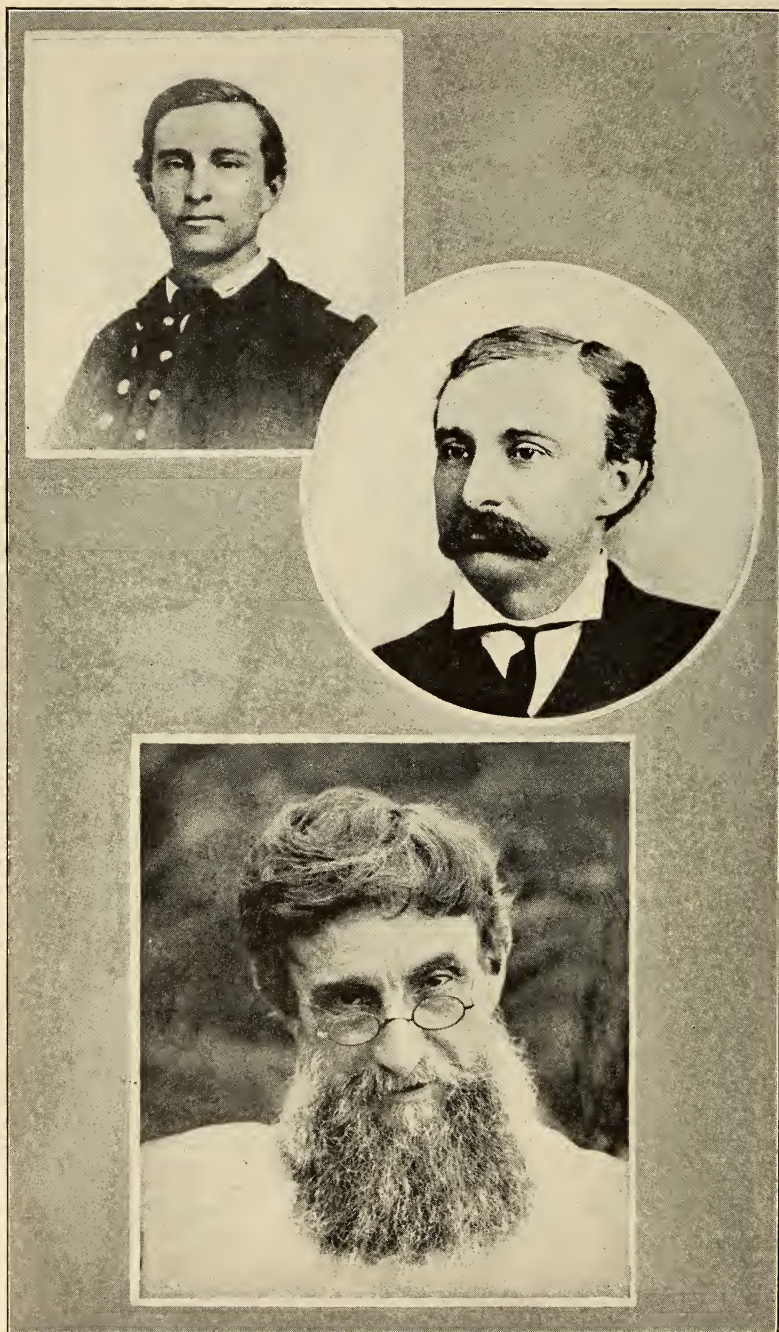
He was strongly recommended for appointment as captain and H. Q. M., U. S. Vols., by Major-General Geo. H. Thomas, Major-General J. L. Donaldson, Major-General L. H. Rosseau, Major-General Robert S. Granger.

Lieut. Dutton was on the staff of the last named officer from June, 1864, to October, 1865, the end of the war.

Col. A. Wills' testimony of Lieut. Dutton's value as a soldier is herewith given:

"We were in the Army of the Cumberland together as officers. Dutton was a handsome fellow, and one of the best and bravest officers in the army. He was complimented in official orders for bravery. At the close of the war in 1865, Dutton was mustered out of the service, and I then engaged him as one of my superintendents in the locating and purchasing of National Cemetery lands in the Southwest. He was later engaged in caring for and transporting the bodies of the heroic dead of the battlefields, now interred in the cemeteries at Corinth, Mississippi, and Pittsburg Landing, Tennessee. After leaving the Government service, Dutton was employed by the Louisville and Nashville Railroad Company at Memphis, Tennessee; upon leaving the service of the company he engaged in religious work, became a convert to Catholicism, and soon after entered the Trappist Monastery at Gethsemane, Kentucky."

Brother Joseph Dutton came to Hawaii in the year 1886, and



Upper, Lieut. Ira B. Dutton, A. D. 1863.
Middle, Lieut. Ira B. Dutton, A. D. 1877.
Lower, Brother Joseph Dutton, A. D. 1907.

in the early afternoon of Thursday, July 29th, of that year he arrived at Kalawao, calling at my house on his way to the Catholic Mission premises. He took up his residence with Fr. Damien, later occupying a small house near the residence of the priest. Since his arrival, now nearly thirty years ago, Brother Dutton has never once set his foot outside the boundaries of the Leper Settlement; but he could leave, if he so desired—he is not a leper. The Leper Settlement is under the control of the Board of Health of the Territory of Hawaii, and there is no law or statute on its books that can compel a non-leper to remain at the Leper Settlement, if said person desires to leave, move, or reside elsewhere. Any nurse, *kokua*, brother, sister, or other employee who is not a leper, is a free person. There is no such condition as involuntary confinement for a well person, but such statements find frequent place in certain newspapers.

The day of his arrival Br. Dutton took luncheon with me, and I scanned him carefully. He had come afoot from Kaunakakai, a port on the south side of Molokai, about nine miles from Kalawao. It is a hot, dusty, fatiguing trip, even on horseback, yet Dutton showed no fatigue nor travel-stained clothes. He wore a blue denim suit, which fitted his well-knit, slim, lithe, muscular figure. He stood about five feet seven inches tall, had dark brown hair and grayish-blue eyes, low voice, placid features, and pleasant smile; he was reserved and thoughtful, had nothing to say about his past life nor the reason for his seeking seclusion and work at Molokai, and turning his back on the world forever.

Brother Dutton soon demonstrated that leprosy had no power to instil fear in his mind. For many months after his arrival, his daily routine, from daybreak to dark, was cleaning and dressing the sores, ulcers, and other skin troubles; removing carious and necrosed bone—all of the type that leprosy inflicts on mankind. He was methodical and accurate in his work, and quick to learn the rudiments of medicine and surgery. I started him dressing the wounds and sores of the leper protégés of Fr. Damien, and showed him (Dutton) the method of affixing dressings by properly applied bandages and other appliances. Within a very short period he had become so apt that he surpassed his teacher; in brief, "whatever Br. Dutton undertook to do he did it well."

He always seemed to find time to attend to the numerous duties that fell to his lot, the more his work expanded the better he seemed to like it. He possessed a DIVINE temper, nothing could ruffle it, no vulgar or angry speech ever emanated from his lips; although his clothes were cheap, rough, and uncouth, he was always dignified and commanded respect. He never ceased to be neat and clean, and I have always believed this was his salvation

and protection from leprosy. I enumerate some of Br. Dutton's manifold duties performed daily: Fr. Damien's companion, secretary, servant, nurse, and other menial work, sexton, sacristan, verger, purveyor for Fr. Damien's Homes and his household, hospital steward, dresser, clinical clerk, later manager of the Baldwin Home, sanitary engineer, architect, landscape gardener—the site of the Baldwin Home was formerly an unsightly pile of rocks, note the transformation, as shown in the picture. Br. Dutton was also postmaster. For years, single-handed and alone, he filled well all of the above offices.

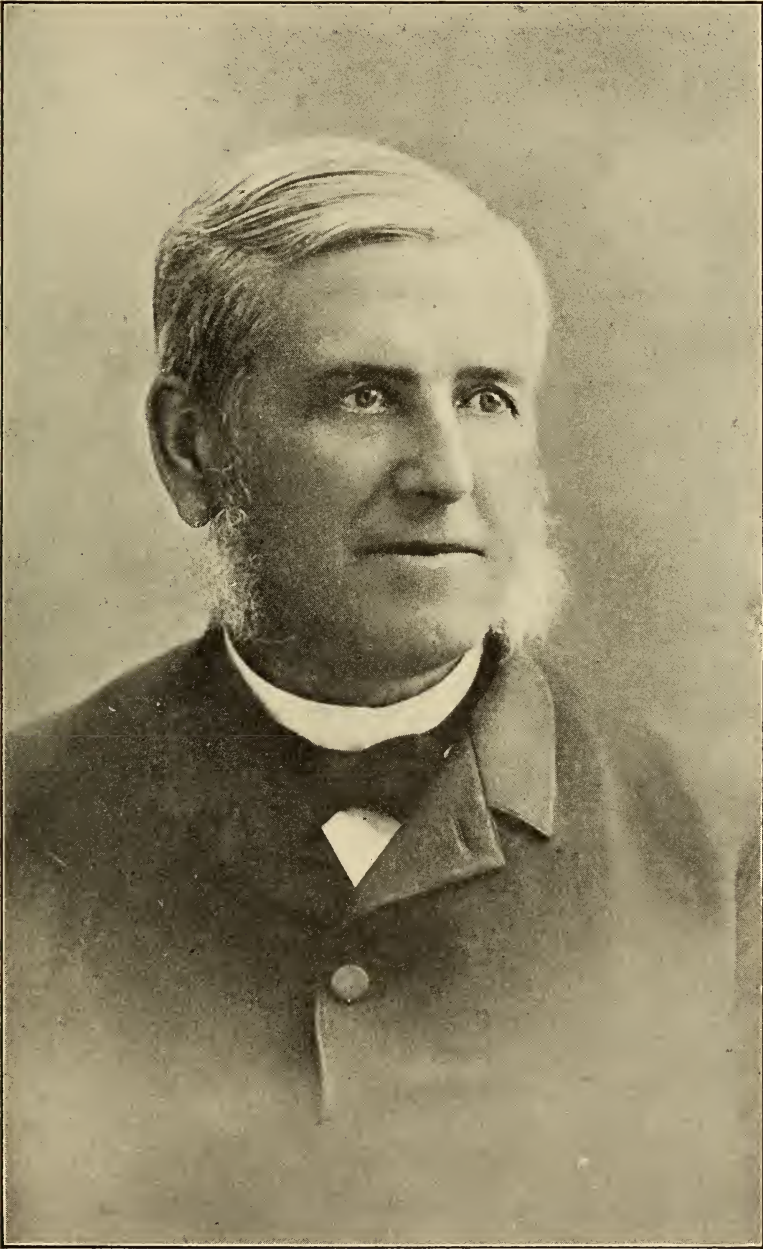
Br. Dutton will be seventy-three years of age on April 27, 1916. His services have been invaluable to the Board of Health and all the lepers; his earthly reward has been board, lodging, and a few dollars a month, but his greatest and most cherished recompense has been the love and esteem of those afflicted persons he has had charge of, who number at the Baldwin Home alone 1,148 to July, 1915. This Home opened in the year 1894, for single men and friendless boys, comprises forty-five houses, and has an excellent sewerage system. The grounds are well kept—have a forest of 5,000 eucalyptus trees, a large number of Samoan cocoanut trees, all planted under the supervision of Br. Dutton.

During his thirty years of residence, great changes have taken place; grass houses, lean-tos and shacks have given place to comfortable cottages with neat gardens; the meagre water supply has been supplanted with an abundant and never-failing source, sufficient for a modern city. These improvements, begun in the year 1887 (due in the main to the energy and forcible personality of the then Minister of the Interior, Lorrin A. Thurston, ex-officio member of the Board of Health, and in later years—the nineties—to William O. Smith, many years president of the Board of Health), are still in progress, until the Leper Settlement has reached a degree of efficiency, that it is unquestionably the *foremost* institution caring for lepers in the whole world.

I add, in concluding Br. Dutton's life history, he has always been careful, cleanly, and prudent whilst in contact with leprosy; and after thirty years of intimate association with the disease he remains unscathed.

THE CHARLES R. BISHOP HOME, KALAUPAPA

The noble, devoted, and priceless work carried on at this Home for leper girls and single women, is beyond all earthly praise and approval. The venerable and saintly Mother Superior Mary Anne, and her Sister companions, are prototypes of Martha and Mary and other holy women of the Biblical times. The Catholic Sisters dread publicity, hence the history of their lives, devoted to the service of God, cannot be written or printed.



REV. CHARLES M. HYDE, D. D.

1884 A. D.

REV. CHARLES M. HYDE, D. D.

Dr. Charles M. Hyde arrived in the islands May 31, 1877, and died in Honolulu, October 13, 1899, aged sixty-seven years.

Extract from "The Friend," November, 1899: "Dr. Hyde's executive ability and intelligence made him a trustee in many educational and other institutions—notably Oahu College, Kamehameha Schools, and the Bishop Museum.

In each of these he has occupied a leading position; in the organization and development of the Kamehameha Schools, his has been the leading hand in the work * * *

(For the above information, I am indebted to Mr. Thos. G. Thrum, eminent statistician, and foremost in knowledge of all matters pertaining to the Hawaiian Islands.)

Glancing over the dates of Dr. Hyde's arrival and death, it will be seen that the doctor had resided in Hawaii well over twenty-two years. I will add the following supplemental facts showing the wide scope of the doctor's life work and activities.

"Prominent church worker, recording secretary of the Hawaiian Evangelical Association, trustee on the Board of the Public Library, and head of the North Pacific Institute, a theological training school for young men of Hawaiian, Caucasian-Hawaiian and Chinese-Hawaiian descent, to ultimately fit them for ordination to the priesthood."

The doctor was scholarly, polished, and refined; belonged to the best class of Americans, he came from New England. He rather reminded me of a college proctor or don, such as we have in European universities, or even the rector of the same institution.

The doctor's disposition was placid and calm, his voice low, his features were handsome and refined, his eyes and the general expression of his features tended to sadness and thoughtfulness combined, his personal appearance was good. He did not amass wealth; he was in no position to do so, he worked amongst the poor, opened his purse to them and gave them freely of his means.

He once authorized me to make a certain purchase; I thought the limit price was 50% too low, and asked the doctor to allow me to use my discretion and give more, rather than lose the purchase. He answered, "I cannot afford it, my purse is strained to the utmost; if you cannot obtain it at the price named I must go without it." This is pretty good proof the doctor was not wealthy.

My first meeting with Dr. Hyde occurred in September, 1884,

at Waialua, Oahu, at the supper table in the home of the venerable and motherly lady, Mrs. Ursula Emerson, of original missionary stock.

The doctor and I spoke not, no introduction being made.

VISIT TO THE LEPER SETTLEMENT

My second meeting with Dr. Hyde took place on the afternoon of Wednesday, September 2, 1885, at Kalawao, Molokai. The doctor had landed at Kalaupapa from the palatial steamer "Mokolii," alias "Mud Hopper," of ninety-six tons burden.

It was his first visit to the Leper Settlement, his business was to look after "church matters" and also consecrate the newly erected Protestant church at Kalaupapa. He accepted such hospitality as I could extend to him, and remained in the Settlement some weeks.

During the following days Dr. Hyde was busy with church affairs; later on he made a careful examination, investigating fully the schools and homes which Father Damien had founded for the orphan and friendless children. The doctor marveled greatly at the vast amount of work undertaken by Father Damien, and the promising results obtained with such a paucity of material. Dr. Hyde emphasized the benefits that would accrue in having more commodious and up-to-date buildings in every respect, for girls and single women, for boys and single men; nursing was also debated and the conclusion reached that paid, trained foreign nurses were out of the question, Sisters and Brothers of Catholic organizations being alone available and promising success. Father Damien only too eagerly acquiesced and hoped ultimately to see those changes carried out.

RESULTS OF DR. HYDE'S VISIT

Dr. Hyde's visit was directly and indirectly of untold benefit to the lepers. The doctor had the *ear* and confidence of wealthy men connected with the then Fort Street Church, now Central Union, both Mr. Charles R. Bishop, and Mr. Henry P. Baldwin of Maui, were connected with this church.

The congregation and membership of Fort Street Church was then the wealthiest and largest in the islands, and Dr. Hyde's visit to the Leper Settlement ultimately brought about the desired result. A few years afterwards, excellent and commodious homes were built by Mr. Charles R. Bishop at Kalaupapa for



FORT STREET CHURCH, CORNER OF BERETANIA, HONOLULU.

In the year 1892, this building was dismantled; the congregation moved to their handsome new church at the corner of Beretania and Richards streets, called "Central Union."

After the destruction of the "Bethel Church," its congregation amalgamated with the Fort Street Church, and subsequently with "Central Union."

girls and single women, and by Mr. Henry P. Baldwin at Kalawao, for boys and men. Both these donors are dead.

Mr. Joseph Dutton was put in charge of the Baldwin Home and Mother Superior Marianne in charge of the Bishop Home, and both these parties still survive, and still are active in discharge of their duties.

These homes built by Protestant dollars are in charge of and administered by Catholic Sisters and Brothers.

If Hawaii nei is the "Melting Pot" of the numerous races which inhabit its islands, it can also be truly said that Hawaii is also the "Melting Pot" of religions and sects, where all dwell together in peace and amity. In no other country has the Brotherhood of Man and the Sisterhood of Woman reached such an advanced stage as in Hawaii. We have no beggars! We have no poor houses! How many other countries can assert the same.

PARTIAL AND IMPARTIAL DONORS

In former years only four denominations existed in Hawaii—Protestants, comprised of (1) American Congregationalists, and (2) Episcopalians, chiefly British, (3) Catholics, (4) Mormons.

The chief wealth and power (as I have before stated) was in the hands of the American Protestant church (original missionary church.)

Today the missionary children and grandchildren, are the chief supporters and voluntary benefactors of the Leper Settlement; the Catholics coming next.

The Episcopalians had no place of worship at Kalawao, the zeal and activity of Father Damien took most of them into his fold. When I was at the Settlement, the Catholics, Calvinists (Missionary Congregationalists), and the Mormons all had their own church buildings.

There also existed certain adherents of the royal families of Hawaii with strict dividing lines; the followers of Mrs. Bernice Pauahi Bishop, the most numerous, haughty and distingué, then the followers of Queen Emma, and lastly the followers of the reigning Kalakaua dynasty. Quite naturally gifts and donations from each of these royal sources were distributed to their partisans.

In marked contrast was the distribution of gifts and donations to the lepers for Christmas, furnished by the members of the various churches in Honolulu; especially impartial were the donations from the missionary children, they were for all, irrespective of church or creed.

Money and other gifts were placed in my hands with no restrictions whatever—"Give to the most needy" was the injunction. All of which goes to show that the people of Hawaii are remarkably liberal and progressive in their ideals, and set a shining example to other countries to follow.

During the term I held office as physician to the Leper Reservation, the pastor in charge of the Protestant religious work was the Rev. J. Hanaloa; he was past sixty years of age, semi-blind and enfeebled; he was burdened with a sick wife, a victim of the nodular form of leprosy. This condition of his household naturally hindered him in his work. He was the type of old Hawaiian, who is rapidly passing away; minded his own business, frowned down upon drunkenness, card playing, and other occupations that lead to nocturnal orgies; his rebukes were given in such a mild manner that the sinners could take no offense.

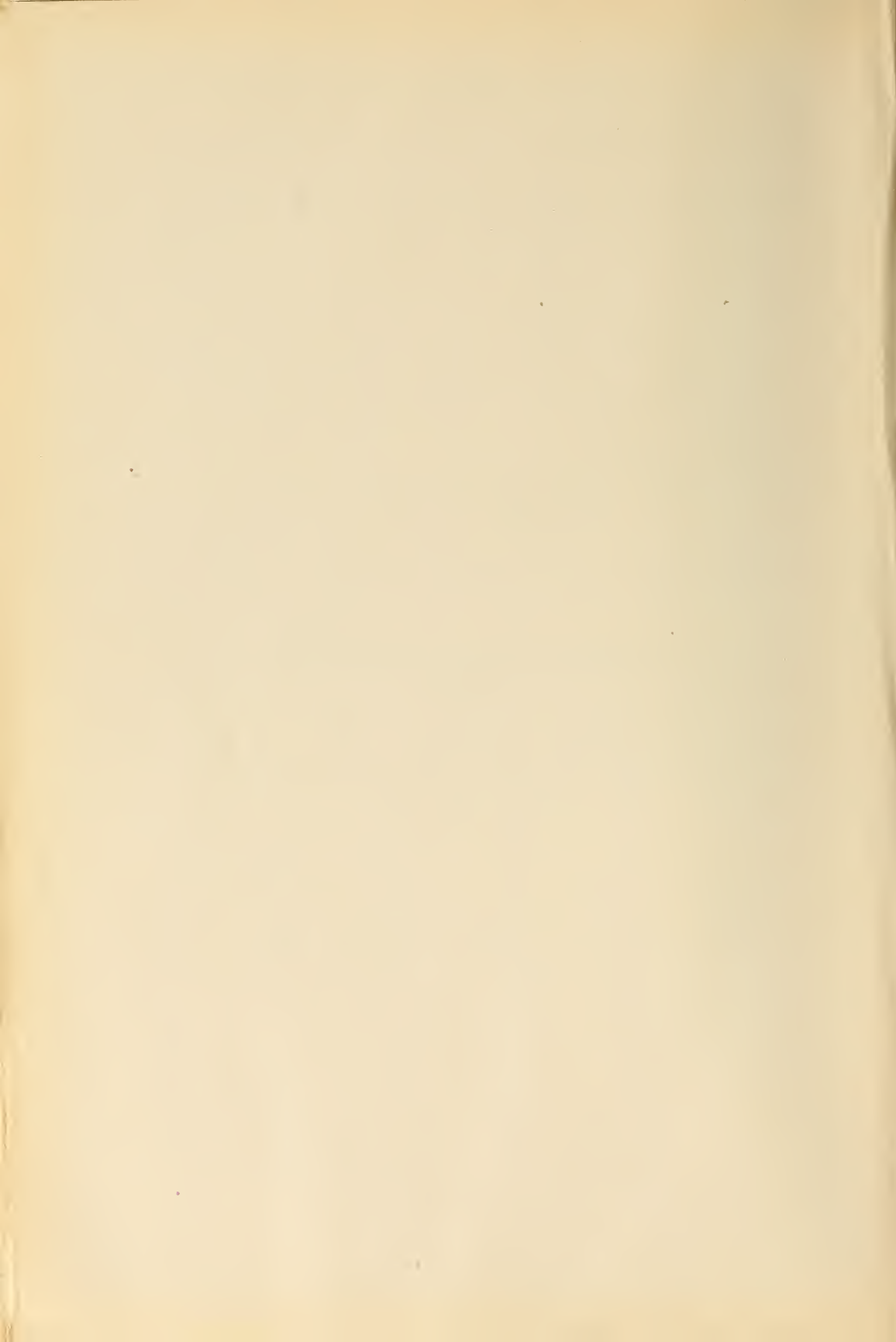
The Rev. Hanaloa had been brought up under the tutelage of the Rev. J. S. Emerson and his wife Ursula, and his (Hanaloa's) religious and other pastoral work did them much credit at the Leper Settlement.

Oliver Goldsmith has informed us in his beautiful and soul-stirring poem, the "Deserted Village," of the village pastor, who passed rich at £40 a year—\$200. The incumbent of the pastorate at Kalawao, Molokai, received a salary somewhat less, but it was materially added to by Mrs. Rice (Mother Rice) of Kauai, who always had a kind word and money for the poor and needy.

Another worthy, generous, unassuming gentleman also contributed to the stipend of the Rev. J. Hanaloa—the late James B. Atherton, who deceased April 7, 1903.

PART IV.

REPUBLISHED BY REQUEST
REPORTS
ON
LEPROSY AND THE LEPER SETTLEMENT
Thirty Years Ago



REPORT OF HER MAJESTY QUEEN KAPIO-
LANI'S VISIT TO MOLOKAI, BY H. R. H.
PRINCESS LILIUOKALANI,
JULY, 1884.

To His Majesty the King:

Sir: I have the honor to submit the particulars of Her Majesty's visit to the Leper Asylum on Molokai, whom, in obedience to Your Majesty's wishes, I accompanied thither. The steamer "Waimanalo" having been placed at the disposal of Her Majesty by Hon. J. A. Cummins, the party embarked early on Saturday, the 19th of July, 1884, leaving Honolulu at 3 a. m. and arriving at Waimanalo at 8 a. m. that morning.

The weather proving favorable on Monday morning, we left that port for Kalaupapa, reaching our destination in the afternoon. At 4 p. m. the party consisting of Her Majesty the Queen, Hon. J. A. Cummins and lady, who were in attendance upon Her Majesty, Dr. Edward Arning, and Mr. C. B. Wilson, comptroller to my household, landed and were received by Ambrose Hutchison, the assistant superintendent, Rev. Father Damien, and Rev. Father Albert, who escorted the party to a house where a large number of the patients were assembled.

The Hon. J. A. Cummins addressed the people and stated the object of the queen's mission among them.

Her Majesty then arose and with the usual salutation of "Aloha Oukou," briefly addressed them as follows:

"With love I greet you all. My heart-felt sympathy and that of His Majesty the King, your Father, is with you in your affliction. The King has sent His Sister, the heir apparent, to accompany me in this mission, to show his love to you. I also bring to you the love of the people of Honolulu, the ladies and gentlemen, natives and foreigners, and those of the other islands who have assisted me in raising the necessary funds and contributions for your relief.

I have been made familiar with your letters to me, and petitions to the Legislature, and whatever remarks you may have to make we will be pleased to hear them while we are with you.

The principal object of this mission to your asylum is to

know your condition, and to render such assistance as may be necessary for your comfort."

The people were much moved with the queen's remarks. The assembly standing during the address. At the conclusion of Her Majesty's remarks, Kailikapu made the following address: "Your Majesty, Your Royal Highness, and gentlemen, I must, first, on behalf of my fellow sufferers, express to you our warm and heart-felt feeling and thanks for this exhibition of your tender love and affection towards us, your afflicted people. I have been an old inmate of this asylum, and this is the second time I have been removed from Honolulu to this place, where I suppose I must remain like my afflicted fellows to linger out a miserable existence without a hope of cure; away from the comforts of home and the society of family and friends. Since my last removal to this place, by a close observation of the workings of the disease here, I have become thoroughly convinced of the non-contagious nature of the disease. Instances are numerous here where men afflicted with the disease have been accompanied by healthy wives, who have lived with them, and nursed them for years until death, without the wife becoming afflicted by the disease, or in the other case, the husband. Children, too, have been born of diseased parents and reared among the lepers, without contracting the disease; several such cases are among us now. Such being the case, I cannot see how the disease can be called contagious or why we are segregated in an isolated place, where our most urgent wants are but poorly supplied. Poor food, insufficient as regards quantity, and want of proper care and nursing, are prominent among the ills of which we have to complain, and if the government cannot supply these as they are supplied to us when at home, they should return us whence we came.

Our rations consist of 21 lbs. of paiai, 7 lbs. of beef, and 1 lb. of sugar per week. Of this 7 lbs. of beef, 5 are often made up of bone. This is sufficient for one person only for three days, and the remaining part of the week he has to go without food. Those living at Kalaupapa have to travel five miles to get their rations, and there being no means of conveyance supplied, such as are too feeble to travel that distance, and have neither horses of their own to travel on, or friends to assist them, are often deprived of food. Many poor, disabled people, too, are unable, in their feeble and mutilated condition, to prepare their own food

after they have got it. When the rainy season sets in the streams would be swollen, and these feeble ones would sometimes be so exhausted that they were unable to cross the stream on their way home, and therefore had to wait until the storm and freshet subsided before they were able to cross. From this cause many have taken cold, and died in consequence.

An order for six dollars' worth of clothing is allowed per year to each patient, which they get filled at the store of the Board of Health. This is altogether insufficient. One woolen shirt and a blanket is all it will buy. On account of being thus poorly supplied with clothing, some died of cold, especially in the winter months. One great need also is wholesome water to drink and use for preparing food. Now we have to go three miles for water and pack it ourselves, and very often we are compelled to use the brackish water from a well near the beach.

I will also speak of another matter—that is, of the healthy children amongst us. Why are such children (many of whom are well grown, and without any sign of the disease about them), allowed to remain here and become patients through contagion? Why are they not taken elsewhere and properly cared for?"

The second speaker, Mr. Kahanapule, said: "Greeting to you our Queen, and to your Royal Highness and gentlemen: By the request of the patients now residing at Kalaupapa and Kalawao, I was selected from among their number to draft a petition in their behalf to be presented to the Legislature, now in session, in which was made a statement of our needs and a prayer for relief—a duty I was glad to perform. The confidence they have placed in me to act in their behalf, I now avail myself of on this occasion to make known to you what I believe to be our sorest needs; I speak in the interest of those people you now see around you, and more especially of those in crippled condition, unable to be present to meet you upon this occasion, and of those who have joined with us in showing our appreciation of the great love you have shown to us in the willingness with which you have crossed the dangerous ocean to meet us, and hear our appeals and relieve our necessities. Our needs are many. Foremost among them is the necessity of clothing, someone with authority to settle our difficulties, and satisfactorily dispose of them. At present we have to submit without appeal to the arbitrary ruling of Agent Meyer of the Board of Health, and are often incarcer-

ated for alleged offenses in a summary manner, and without a hearing of the case.

It is the desire of many of us that a resident judge should be appointed, who will always be present to hear and determine in a proper manner many of the little grievances between the members of our colony, and also be empowered to punish justly any offence against the peace and good order of our community. Our general superintendent visits us only *once during each quarter of the year, and remains altogether too short a time* to make such investigations as are necessary to the end of justice. Especially frequent are desertions in married life, and the annoyance suffered on this account is great. Many, today, amongst us are living in adultery, because they feel secure in their removal from the reach of the law. With the general government I have no fault to find, as every endeavor is being made to provide for our wants; but I do blame the Board of Health for its laxness in carrying out a proper system of supplying those wants which have been liberally provided for by the government. Our paiai, for instance, is landed at Waikolu Gulch, about five miles distant from Kalaupapa, and the patients of that part are necessitated to pack it themselves all that distance. This is a grievous task to many, while to those who are weak it is an impossibility. The place of landing, too, is so situated, and the road to it impassible, that in stormy weather travel there becomes actually dangerous, and at times pack-horses, together with their burdens, have been washed away and drowned, and men too have barely escaped with their lives. In such an event, those to whom the food belongs are necessitated to go without their supply until a new lot has been received. After the paiai is obtained many of the more crippled are unable to prepare it themselves, and can have no water to mix it with unless they are willing to use the brackish water near the beach, which is entirely unfit for any such purpose.

"Those who prefer it may, in lieu of paiai, have nine pounds of rice and seven pounds of hard bread per week. They are compelled to make the change when the poi supply is short, or when they are unable to go that long distance for paiai. But such food is not satisfying, even when we have eaten our fill with other kinds of food we are not satisfied. Poi is our natural food, and nothing could take its place. Kokuas who help the patients have to be fed out of their rations, and when this is the case the weekly supply of food is not more than sufficient for three days, and the unfortunate one goes part of the time hungry.



QUEEN KAPIOLANI.
Wife of King Kalakaua.

Many of the patients have kokuas to prepare their food for them, otherwise they would go without food, and sometimes do, and die of starvation. What the previous speaker has said in regard to the insufficiency of warm clothing and the number of consequent deaths is perfectly true. If the government intends to keep us here, let the Board of Health be instructed to exercise a better care over our wants. Each of us has an allowance of six dollars a year."

Mr. Ambrose Hutchison, who is under-superintendent of the entire Settlement, said: "Being myself an employee of the Board of Health, I feel it my duty to uphold the actions of the Board where they are defensible, but at the same time I feel it my duty to my fellow sufferers here that I should speak plainly of matters as they are. I concur in the statements made by the previous speakers with reference to the food supply, and the mode of delivery. Their statements are not exaggerated. For those who are so crippled as to be unable to attend to their own wants a hospital is provided; but their prejudices against the institution prevent many of them from availing themselves of the comfort there afforded. Their dread of the place may be easily explained, when we take into consideration the fact that it was formerly a practice to send along with each patient, by the same conveyance, a coffin he was soon to occupy. Add to these things the fact that no proper care or nursing is provided, and the horror of the place so generally entertained by the patients is easily explained. The great want here is the institution of more approved nursing facilities. The hospital patients should be also supplied with better accommodation generally, and be provided with a more appropriate place in which to take their meals. If to such provisions were added that of a resident physician and an efficient staff of nurses, the main source of objection would be removed, and then they might enter the hospital willing instead of avoiding the place as they do now. Could some Sisters of Mercy be induced to come up and remain among us, as is now the case at Kakaako, it would certainly be a great blessing. The nursing is now performed by kokuas, who receive no pay, and whose hearts are not in their work, and amounts to nothing so long as they attend to the wants of their own people. They go and come as they please, and patients suffer much from their neglect. One thing I would like especially to call your Majesty's attention to, and that is among us are a number of children born of diseased parents, who themselves are *entirely free* from all symptoms of the disease."

Taking in his arms a little girl about ten years old from the crowd, the speaker said: "Here is one of them, and there are here between fifty and sixty just such cases as this, and at various ages. These should be kept aloof from the diseased and properly cared for in a separate asylum, and not be allowed to remain where the chances are of so many of them becoming patients by contagion. I would urge upon the Queen and the Heir Apparent to have this matter attended to, and to allow the weight of their elevated positions and the great influence they possess to bear upon the Board of Health, in order to bring about the realization of so worthy an object. In conclusion I can only express my hope that this royal visit may be pregnant of future good, and may prove the harbinger of an improved moral and social condition among us."

Two other speakers followed in substantially the same strain as the two first speakers; one of them, a young man of the age of thirty years, spoke at length upon the proposition for the appointment of a resident judge, and told a piteous tale of the infidelity of his own wife, and his want of means of redress. He had no other complaints to make against the Board of Health. What was done for them was perfectly satisfactory, and they were all well provided for. A murmur of disapproval was at once raised, and interfered with the continuation of his remarks.

After making such visits as time would allow among the tenements of Kalaupapa, Her Majesty and company proceeded on horseback to the main settlement, arriving at about 7:30 o'clock p. m. There quarters were provided for the royal party by Mr. Van Geisen in a new house lately built for the special accommodation of visiting physicians. At supper, the Rev. Father Damien was a guest.

After breakfasting on the morning of the 22d, the party consisting of Her Majesty, attended by Hon. J. A. Cummins, Dr. Arning, Mr. C. B. Wilson, Mr. J. H. Van Geisen, and the undersuperintendent, Mr. Ambrose Hutchison, began to inspect the houses of the patients.

In the first place visited there were nine patients, one of which was a very bad case. He had been twelve years at the Settlement and nine years in the Hospital; his age being about sixty years. Three were about the age of thirty years, and the remainder boys between fifteen and seven years of age.

To questions put by Her Majesty, they complained that their bedding (only mats), was too hard, their covering insufficient to keep them warm at night, and their food neither properly pre-

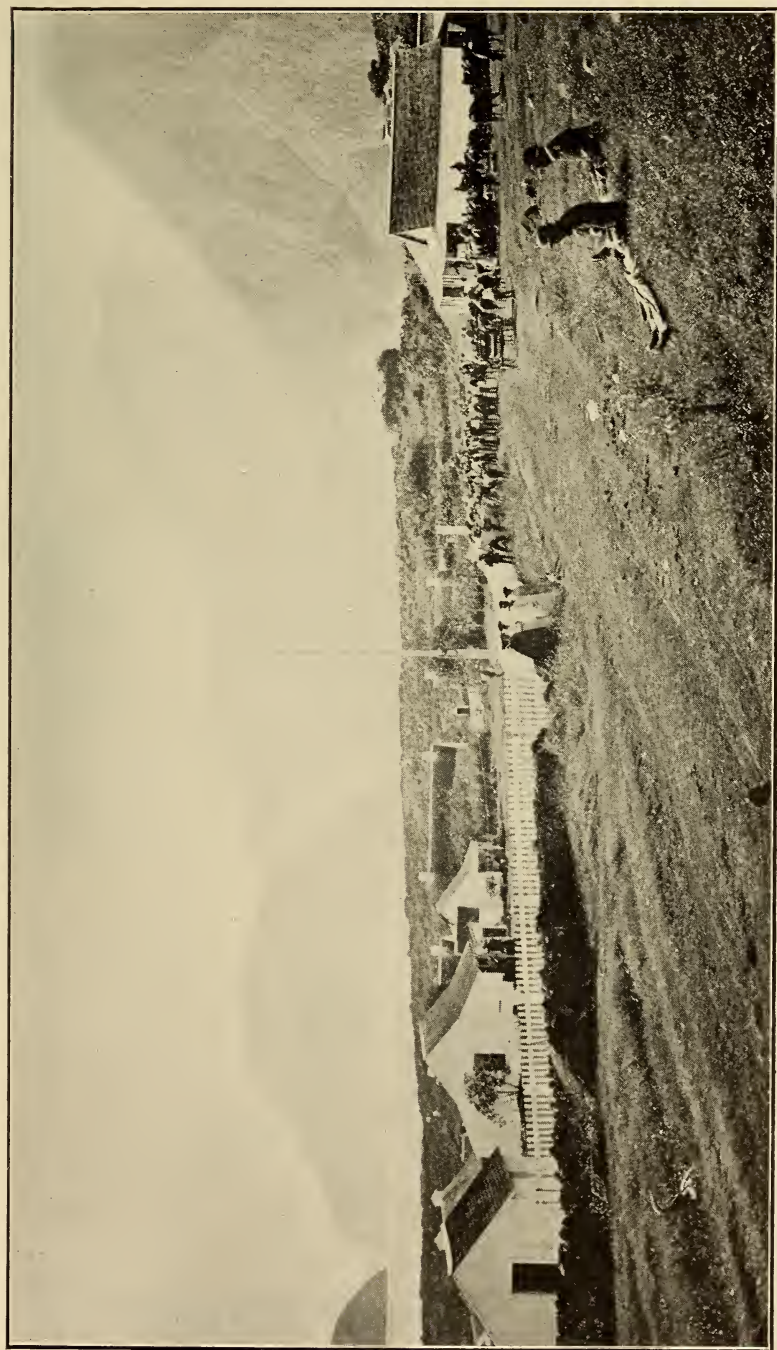
pared nor always sufficient in quantity. They complained also of neglect at the hands of the *kokuas*, to whom were detailed the work of administering their medicine and dressing their sores.

They also expressed their desire for the attendance of a resident physician, who could prescribe for them in the many cases of inter-current diseases, such as bowel complaints and other troubles which were frequent among them. When questioned as to the conduct of the visiting physician, they said that his visits were so short, and his work so hurried, that no practical advantage was to be derived from them.

In the second ward were ten patients, ranging in age from twenty-five years to seventy. Most of these cases seemed to be of the anaesthetic form of the disease, there being but comparatively little distortion of features. In the majority of these cases fingers and toes were either entirely wanting or in process of amputation, rendering the victims almost entirely dependent upon the help of others. Some had bound up their own ulcerated extremities themselves after a primitive fashion. To the question asked whether or not such ulceration could be healed by the appropriate treatment, Doctor Arning answered in the affirmative, qualifying the statement, however, by saying that in some cases the healed surfaces might again take on ulcerative action, that being the natural tendency of the disease. These patients uttered the same complaint as those previously visited; but complained especially of the neglect of the *kokuas*, and the difficulty they often experienced of getting a sufficiency of water regularly supplied them, notwithstanding the fact that there was an abundance of water on the premises.

The third ward contained eleven patients, five of whom were sixty and seventy years old, three about thirty-five years of age, and the remainder between seventeen and twenty. One aged twenty-five years had totally lost his sight, and all his fingers and toes. This result of the disease required him to be fed by another patient of the ward. Among those was the old man Nakahuna, well known to all old residents of Honolulu as the vendor of Hawaiian curios there a few years since. He has had the disease about four years, and has been an inmate of the hospital at Kalawao for three years.

Worthy of remark is the case of a woman named Kealahua, whom we met in this ward. She came to the Settlement about fourteen years (1869) since with her leper husband, who died there about seven years ago of the disease. She herself is robust



KALAWAO, 1884 A. D.

The Hospital buildings enclosed by the picket fence. The building on the right is the Board of Health store. The people in the road and around the store, are listening to the harangue of some oily-tongued politician. In the background the mountains display the grandeur of the scenery.

and to all appearance without any symptoms of the disease about her, and is engaged by the Board to do the entire washing for the patients at the hospital, at a salary of \$10 per month. She has been the mother of four children, one of whom died of acute disease without having developed leprosy, another of leprosy, the remaining two now living being lepers. (In the year 1888 this woman developed leprosy.—Author.)

The fourth ward contained ten patients, all of whom were women. Of these eight were between nineteen and thirty years of age, and two about sixty-five years. Among them was a young girl of about ten years who had accompanied her leper grandmother there. This girl, after a careful examination by Doctor Arning, was pronounced to be free of leprous symptoms, and her removal recommended. The great complaint here seemed to be of the insufficiency of warm clothing and comfortable bedding.

The fifth ward contains two rooms, in one of which were six young men between 16 and 20 years, all of whom were inveterate cases. In the other room were two native boys and two Chinamen. One of the boys was threatened with blindness from the disease. Insufficiency of warm clothing was also their complaint.

The sixth ward was occupied by one patient only, who was in the last stage of the disease. He was horribly deformed in features and his eyes totally blind. He seemed to be undergoing intense suffering, and was muttering, throwing himself about in the wildest manner. Doctor Arning was called in and gave him a draught which seemed to give speedy relief; and at the end of half an hour he was sleeping quietly. Such cases as this prove the value a resident physician might often be.

In the seventh ward were four very bad cases. One in particular was noticed, where, though the face showed little disfigurement, the whole trunk was a mass of inflamed or suppurated tubercles which emitted an offensive smell unbearable to stand. In noticing this patient the doctor observed that with proper medical treatment, such cases as these might be greatly alleviated and a great deal of unnecessary suffering be prevented.

In the eighth ward were three boys, between the ages of fourteen and seventeen years, all bad cases. They seemed diffident, had no complaints and nothing otherwise to say.

The lock-up was next visited. The building is about 10 by 15 feet in dimension, and contains two rooms about 6 feet long and 9 feet wide respectively. These are poorly ventilated by small iron gratings situated on the leeward side of the building. In

one were two Chinamen, both sentenced to one months' confinement on a charge of assault with a deadly weapon upon one of their countrymen. In the other was confined a native named Makahui, sentenced for burglary in the store of the Board of Health, and abstracting therefrom money to the amount of \$240, his partner in the crime, one Naai by name, had terminated his own life shortly after sentence, by suspended himself from the grating of his cell.

The cooking arrangements are commodious, cleanly kept, and convenient; a cooking range being supplied sufficiently large to do the cooking for 150 persons. The poi room is also spacious and clean.

As numerous descriptions of the Settlement generally, and of the hospital in particular, have heretofore been published, it will be unnecessary to give a further description. But here I may say that great credit is due to those in charge for the very neat and cleanly manner in which everything connected with the premises is kept.

After leaving the hospital premises, the party next visited the storehouse, situated not far distast from the hospital and immediately across the road. Upon a close observation of the stores, all the articles provided appeared good, with the exception of the sugar, bread and salmon, the last mentioned article being so mouldy and soft as to be *unfit for use*; the sugar dark and dirty, of about No. 3 or No. 4 quality; and the bread tolerably good for medium bread, though inferior to that supplied to the Oahu jail.

There are about 14 head of cattle butchered per week. Allowing (which, according to the statement of some butchers, is a large average) that each bullock weighed dressed, 350 lbs., and seven pounds per week of beef to an individual, the amount of beef slaughtered would supply *only* about 700 people; whereas, there are at the Settlement, including the kokuas, a population averaging between 850 and 950 souls.

The arrangements for slaughtering are most primitive; and the water supply insufficient for the cleansing of the meat. Arrangements, however, are now being made, whereby this defect will soon be remedied. A new reservoir is now in process of construction near to the place of slaughtering, and designed to be filled from pipes connecting with the valley supply.

The next subject which engaged the attention of the party was an inspection of schools under the charge of Rev. Father

Damien. The buildings occupied for this purpose are supplied by the Board of Health, one of which is used for a boys' school and the other for girls, being situated in near proximity, and on the opposite sides of the road. Both are within the vicinity of the mission church.

In the girls' school are sixteen pupils in all, ranging in age from nine to seventeen years. Among these was the young girl Luahiwa, of whom mention was made by Dr. Fitch in his late biennial report. Of all these scholars she bore the worst marks of disease. Out of these children there were four between nine and eleven years of age who exhibited no external signs of the disease; but one, upon careful inspection by Dr. Arning, was declared to be in the incipient stage of disease.

In the boys' school were twenty-six pupils, all of whom were well marked with the disease.

The pupils of each school are separately lodged and fed. They are all either orphans or friendless, and under the immediate care of Father Damien and a native woman named Kuilia, not herself a leper.

After leaving the school the party proceeded on horseback, for the purpose of inspecting the old and the newly proposed sources of the water supply of the Settlement. The system now in use, and which has been so almost since the establishment of the Settlement, has its source in the valley of Waileia. It is now recognized by the Board as inadequate to the needs of the place, and a proposition has been made to bring the water from Waikolu Valley—about two miles further on. Waikolu is the place where the paiai supply of the Settlement is landed and dealt out to the patients, being about three and a half miles from Kalawao, and five and a half from Kalaupapa. After traveling the road to this valley, one is forcibly struck with the force of the universal objection made by the patients, to the great distance they have to travel for their food.

The water supply here is abundant and never-failing, and capable of supplying the needs of a town larger than Honolulu. The scenery of this valley is grand. The numerous cascades darting out in all directions from over the lofty precipices, the spray gracefully falling among the dense shrubbery and covering the green foliage as with gems of pearls. A sight seldom seen or surpassed in magnificence and beauty.

In the valley are several acres of land now lying idle, which might be utilized at a small outlay, in the cultivation of taro and

other products for the use of the Settlement. The landing of two boat-loads of paiai during the sojourn of the party there afforded an opportunity of realizing the fact that a number of complaints, already enumerated, were not without foundation. The stream was so swollen by the rains which had been unceasing during our visit, that after a difficult landing had been effected, it was still more hazardous for the animals with their heavy packs, and they had to be forced to cross over the stream.

After staying in the valley for half an hour, the party took the opportunity of inspecting a proposed new landing about half a mile from the hospital, thence returning to Kalawao and visiting on the way every house to be seen. Most noted among the houses visited were the dwelling of Kaulamealani, Napua, Kuanea and Kii. The two last named individuals were pitiable objects indeed and entirely dependent upon the friendly assistance of their neighbors for what help they received. Their fingers and toes were almost entirely gone with the disease. With suppurated hands and stumpy fingers they had improvised rude bandages for relief. Hospital accommodations and aid were clearly needed, but in reply to the question put to them, they said that they had a horror of entering the hospital.

Her Majesty, as well as others of the party, was much affected at the touching sight of these two old women, utterly unable to help themselves, and promised every exertion on her part toward the removal of any objection that might really exist in the hospital, and that efforts hereafter should be used to render the place attractive and not repulsive. As there was little time to spare, and as Her Majesty had promised to address the people of Kalawao before leaving, she bade the sufferers a kind adieu, and the company wended their way toward the Settlement, arriving at the store where the address was to be given at three o'clock that afternoon. A large number of patients had gathered. Her Majesty proceeded to address them similarly as upon the previous occasion at Kalau-papa. At the conclusion of her address she was heartily cheered by the people. A few among them responded to Her Majesty's remarks, but as they were of similar tenor to those previously given, it will be unnecessary to quote them here. Upon our final parting, three cheers were given for their Majesties the King and Queen.

Before leaving the house at Kalawao, the party engaged itself in planting several seeds of alligator pears and mangoes, taken

from a large supply of such fruit seeds that had been brought by Her Majesty for distribution among the people.

The landing was finally reached at about half-past seven o'clock p. m., after Her Majesty had made a slight detour in order to visit an extinct crater, Kauhako, whose basin is partially filled with sea water by a subterranean connection with the ocean. Before leaving the place, however, Her Majesty again visited every tenement in the neighborhood. Incidentally I would mention an interview which took place at the landing between one of the party and Keliikapu, one of the former speakers, several others being in the company. This man claims to have contracted the disease from vaccination, it having appeared about four years after. He asserted that through the same agency all of his schoolmates had died of the disease. In speaking of other matters he said that a great deal of bad management existed, rendering a loss to the government of about one-third of the cattle driven to slaughter over the precipitous road from Kalae, and thought it would be far less expensive on this account to land them from vessels at Kalaupapa. He said there was ample pasture in the district for several hundred cattle.

He disapproved of the appointment of a resident judge, saying that such an office was unnecessary, and that such an idea had only originated in the brain of one who was looking forward to his own appointment. A foreigner, he said, would never suit as undersuperintendent of the Settlement, as, owing to prejudice, his actions would often be misjudged, and trouble of a serious nature might ensue. Natives would be more likely to overlook or condone the fault of one of their own race, than would be the case if the offender were a foreigner. He said that the present overseer, Mr. Hutchison, was in every respect a good man for the position and universally esteemed in the Settlement. He thought there was urgent need of more hospital accommodation, and medical attendance and nursing. He said that not the least among their difficulties was that of obtaining wood for fuel. As it was now the patients had to travel far and climb the mountain themselves to get it.

Upon a careful review of all the facts elicited by our visit and observation of the existing state of affairs, the following propositions have suggested themselves:

- 1st. As the supply of water is manifestly inadequate to the needs of the population, it would be advisable to put into operation the proposed plan of bringing the water from the valley of Waikolu, where an abundant and never-failing source could be obtained,



QUEEN LILIUOKALANI.

Sister of King Kalakaua.

and the supply so created should also be extended to Kalaupapa, where brackish and unwholesome water is now only obtainable. Here the water is often rendered absolutely unfit for use by an overflow of the tide into the well from which the supply is derived.

2d. A resident physician and an assistant are needed, whose dwelling place should be in near proximity to the hospital, that being a central locality. The patients die in many cases from maladies, such as diarrhoea, dysentery and other complaints that can be treated, if proper medical aid was at hand.

3rd. The hospital accommodation should be increased so that at least two hundred patients could be admitted.

4th. If possible, Sisters of Mercy should be induced to lend their aid in carrying out the nursing part, and care of the hospital.

5th. There should be an ambulance provided for the transportation of crippled patients, also two spring wagons for the more convenient delivery of beef and paiai to the lepers, at or near their dwellings.

6th. It would be good to subsidise a small steamer, from 80 to 100 tons, able to carry 20 or 30 head of cattle, 50 cords fire wood and the poi. This steamer should also be used for the transportation of patients from Honolulu to Kalawao.

7th. Lepers who are unable to help themselves should be compelled to take shelter in the hospital.

8th. For the treatment of children in the incipient stage of the disease, with a view to their cure, and also as an asylum for the otherwise healthy children where they could be kept apart for a reasonable time there should be two proper buildings provided in or near Honolulu, to be attended by a competent physician and an efficient nursing staff.

9th. As so much complaint is made about an insufficiency of food and clothing, it might be advisable to increase the supply of the same, and to have the rations altered as follows:

- 4 lbs. of beef delivered twice a week;
- 15 lbs. of paiai delivered twice a week;
- 1 lb. of salmon (for variety sake) per week;
- 4 lbs. of mutton occasionally, in place of beef;
- 2 lbs. of sugar, not darker than No. 2;
- 5 lbs. of salt per month;
- 1 bar, 2 lbs., soap per month;
- $\frac{1}{2}$ gallon illuminating oil per week.

I would suggest also a trial of canned meats, such as are put up in Australia for army and navy use, by way of variety as a substitute for beef, it might be found useful and economical.

In regard to clothing, it would be advisable to supply each person with a certain amount for day and night wear, in place of an allowance in money for that purpose, as at present. Many misuse their money, and suffer in consequence. It would be far better to allow each person two suits of woolen clothes a year and two blankets, the same as is done at the Oahu jail.

There is no reason why a moderately large herd of beef cattle, and milk cows could not be raised on the pasture lands of the Settlement. The beef cattle could be kept for cases of emergency, when weather might interfere with the regular supply, and the cows might be milked, more especially for the benefit of children and the sick.

In the two valleys of Waikolu and Waileia, there is much land uncultivated which would be suitable for the growth of taro, if it could only be utilized, which I believe is possible, if proper inducements were offered to cultivators.

It would be advisable that Waikolu should be abandoned as a place of landing, on account of the dangerous nature of the only road thereto; and that a boat landing be constructed near Kalawao. Such a plan is perfectly practicable and could be perfected with but little outlay. The road to the present landing place is for two miles of its length over lava rock, and overhung by craggy precipices from which frequent showers of stones are precipitated upon the road below, rendering travel dangerous to man and beast. A greater danger still exists in the frequent washing out of the road by the sea, making it on this account, in stormy weather, highly unsafe to travel.

There should be a better system adopted in regard to the kokuas than at present exists. So far as efficiency and reliability are concerned, the present plan of giving the work of the place to kokuas is a failure. It is not to be expected of persons going there as they do, merely to serve their own immediate friends or relations, that gratuitous work could be voluntarily performed by them for others, and any compulsion in this matter is altogether out of the question; and yet it is upon their general help that reliance has, under the present system, to be mainly placed.

The support of every kokua means so much less in the way of food, rations and other necessities to every patient that needs their help, and the question of the propriety in allowing so many healthy

people to place themselves without restriction in the way of contagion, is one to be taken into consideration.

In closing these suggestions, I cannot help stating that the Settlement as an asylum for these poor unfortunate creatures is decidedly the best place for them for a place of strict isolation, and the condition of things is so much better than that at my former visit in 1881.

The party slept on board the steamer, which lay at anchor that night, and at 4:45 a. m. on the morning of the following day, left Kalaupapa for Honolulu, arriving at the wharf at 12 o'clock m., after a smooth and pleasant passage across the channel.

LILIUOKALANI.

DR. STALLARD'S REPORT

Honolulu, March 12, 1884.

To Honorable A. S. Cleghorn,
Member of the Board of Health.

Dear Sir: In accordance with your suggestion, I have the honor to submit the results of my inquiries into the condition of the lepers, and into the administration of the sanitary arrangements intended for their benefit. My first visit was made to the branch hospital at Kakaako. I went through the establishment with Dr. Fitch; and at a more recent visit, I have had the opportunity of conversing with one of the nursing Sisters. I was informed that this hospital was originally established for the purpose of segregating the recent and doubtful cases of leprosy which were to be submitted to careful medical treatment; and in case of cure, discharged. It was also intended that those on whom the disease became fully manifest, should be transferred to Molokai.

In every one of these objects the hospital has proved a failure.

The segregation has never been complete. The granting of permits to visitors has always been exercised on a very liberal scale. The light palisading which surrounds the hospital, accords every facility for verbal intercourse with the inmates. It may readily be scaled from either side. It is notorious that men have obtained access to the female wards, and that inmates have paid visits to their city friends without the knowledge of the superintendent. At the gate of the hospital a crowd assembles daily; and seats have been provided on both sides of the fence, where patients and friends sit in close communication. Stalls for the sale of various luxuries, tobacco, etc., have been frequently erected, and many articles are passed in and out without difficulty.

This intercourse with the outside population has been freely carried on; and there is, in fact, *no real isolation*. Furthermore, the proximity of the hospital to the city presents the strongest temptation, both to patients and their friends, to carry on forbidden intercourse. This is prevented with difficulty, in case of criminals, by the erection of high walls, a method of isolation quite inapplicable to the case of lepers. If, however, by this or any other means the isolation of the lepers were made complete, the hospital would be converted into a prison; the feelings of the patients and their friends would certainly be wounded deeply, and a revolt might be expected on either side.

Nor would complete confinement to so limited an area as that enclosed at Kakaako be justifiable in the treatment of a disease which is eminently characterized by weakness. For leprosy space, air, good food, abundant exercise and occupation are absolutely essential, and without them it is hopeless to look for improvement, and more hopeless still for cure. In Kakaako there was, at the time of my visit, great over-crowding; there were 200 inmates, but recently 39 have been removed; nevertheless the hospital is crowded to its full capacity. Nor is the surrounding air always pure. On one side is a salt marsh, and on the other an offensive foreshore; but if it were still possible to prevent personal communication with outsiders, there is no guarantee of public safety, since no one has yet determined the exact manner in which the germs of leprosy are diffused and communicated. It is not long since it was believed that the contagion of smallpox would not pass the barrier of a few feet of air; but recent experience has shown that the erection of a smallpox hospital in a populous locality becomes a focus of contagion, over-leaping all barriers and spreading its deadly influence to the distance of a quarter of a mile. It is not impossible therefore that the germs of leprosy may be conveyed by mosquitoes, flies, and other insects over the short space which separates the hospital from the city. It is lastly a great objection to the position of suburban hospitals that they depreciate the value of surrounding property, and in case of Kakaako the position in front of the sea makes it a standing advertisement of the existence of leprosy, and a menace to all who dare risk danger of contagion by entering the port. But the most objectionable feature of Kakaako is the complete absence of any classification of the inmates; the practice of sending away the confirmed lepers has long since ceased. Apparently friends amongst persons high in authority are permitted to remain in spite of their condition, while those who have no friends are sent to Molokai, even before the hope of successful medical treatment has entirely passed away.

The hospital has, in this way, lost its special character. New cases and old cases, those with but slight traces of disease, and others at the point of death, those with running sores and those without, are all mixed up, young and old, without any attempt at classification.

Even males and females are not really separate; until recently the more able-bodied were placed, by necessity, with the permanent invalids for whom they were the only nurses and attendants. It seems to me a perfect outrage that any recent or doubtful case

should be sent to Kakaako. In this city I have seen cases of young men and women with some symptoms which indicate the probability of their being eventually lepers. Many of these young persons are well educated and have refined sensibilities. Until the exact mode of propagation is made out, such persons are unfit to remain in public schools or to mix with the children of private families. They belong to the class of suspected, and they present the hope of possible amendment and of cure. To admit such persons to this hospital is to force them into contact with the most contagious forms of the disease. This exposure frustrates every effort of the physician to determine the period of incubation, the early history of the disease and the possibilities of cure; for it is obvious that such persons may be re-infected just as fast as they are cured.

The food supply at Kakaako is both abundant and regular; but it is scarcely expected that whites and foreigners will be satisfied with poi. There is, however, no provision for the preparation of medical comforts, which are now supplied by nursing Sisters from their own kitchen, and at their own expense. It is extraordinary to notice the absence of proper surgical instruments and appliances. On the occasion of my visit it was found necessary that a large abscess should be opened, and it was painful to observe that the instrument used by Dr. Fitch was taken from a post-mortem case, and that it cut through the tissues with great difficulty.

The nursing Sisters bear thrilling testimony to the amiable characteristics of the patients, by whom their services are highly appreciated. They altogether refute the opinion that the natives universally prefer the native kahuna, or that they neglect or refuse to take the medicines prescribed for them. They state emphatically that the natives appreciate the services of kind and attentive doctors and nurses; that they take their medicines willingly, and even ask for them when, by accident, they have been omitted.

In conclusion, I am of opinion that the hospital at Kakaako is totally unfit for the treatment of lepers. Under no circumstances does it seem possible to secure complete isolation; the location is too near the city. The area is too small for the detention of many patients, and there is no possibility of instituting any classification of disease.

MOLOKAI.

I arrived at Molokai on Tuesday, March 5th, in company with Dr. Fitch and Dr. Arning. From information received from

Mr. Meyer, there were 445 males and 300 females, resident on the Settlement; of these 62 were in the hospital. With the kokuas and their children, the total population of the settlement numbers about 1000 persons.

In company with Dr. Fitch, who evinced the strongest desire to afford the fullest information, and under the guidance of the Rev. Damien, we visited many of the cottages occupied by the kokuas and kamaainas, I was most gratified at the cheerful and contented population, the entire absence of grumbling or complaint, the cleanliness of their persons and the comfort and tidiness of all their dwellings, the many neat little plots of onions, sweet potatoes, tobacco and flowers in front of many of their houses and above all, the general possession of a horse and little articles of personal adornment; everywhere we saw the appearance of happiness and freedom. All this contrasted most favorably with the confinement at Kakaako, and it is impossible to doubt that the location is admirably adapted to rob isolation of its greatest terrors. The natural beauty of the scenery; the luxuriance of the vegetation; the richness of the soil; the necessity of riding to the store for beef, poi, oil and other necessities, encourages movement in the open air; and there is no doubt that the lives of many lepers have been prolonged, and their sufferings lessened, by the favorable conditions under which they live.

Nor can it be ignored that the government has done much towards this result. In the place of the wretched grass huts, resting on the damp ground, they have erected many comfortable dwellings of wood. They have brought in water from a neighboring stream; they have erected a hospital and the residence for a physician. They have encouraged those who have the means to build dwellings of a better class, and by allowing kokuas they have greatly reduced the immorality which naturally resulted from separating 200 women from their husbands and forcing them to live in the same settlement with 300 men, also separated from their wives, neither being in any way deprived of their natural desires, and none imbued with any exalted notions of morality.

But here my commendations end, all the natural advantages of Molokai have been destroyed by defective and incomplete administration. The excessive mortality alone condemns the management. During the year 1883, there were no less than 150 deaths, a mortality of 150 per thousand annually and during the present year, the death rate has risen to 25 per cent. per annum or more than ten times that of any ordinary community of an unhealthy

type. This high mortality has not been caused by leprosy, but by dysentery, a disease not caused by any local insanitary conditions, but by gross neglect. The leper cannot stand up against starvation. He requires generous food, and he dies without it is supplied. On paper and by the regulations he is allowed one pound of beef daily. How much does he get? It is not difficult to know. To supply those who are entitled to beef rations takes 5,600 lbs. per week, and from the beginning of the year the following figures show what they really got:

			Pounds	Deficiency
January	2 to January	9, 1523 pounds	.....	4077
January	9 to January	16, 5811 pounds	.....	.....
January	16 to January	23,		5600
January	23 to January	30, 4931 pounds	.....	669
January	30 to February	6,		5600
February	6 to February	13,		5600
February	13 to February	20, 5720 pounds	.....	.....
February	20 to February	27, 620 pounds	.....	4980
February	27 to March	6, 5890 pounds	.....	.....
Deficiency in nine weeks.....				26,526

So for three weeks out of nine there was no beef at all, and for two other weeks there was only a very partial supply, and that probably consumed by officials, whilst for three weeks only was the supply sufficient. During these times, the lepers were given salt salmon in lieu of beef, a food which has been universally condemned by the best medical authorities as entirely unfit for the use of lepers.

Nor was the supply of poi much better. The only complaint made to me by any leper on the Settlement was on this account. For some time past, the supply of paiai has been irregular and much had to be baked over again to make it eatable. At the time of our visit to the hospital no fresh paiai had been received for a week, and none had arrived before our departure, two days afterwards. It was said the persons who supply the Settlement had not been paid, and that they refused to supply more until accounts were settled.

I inspected many bundles of paiai which had been submitted to the oven in order to make them eatable, and I cannot doubt that the dietary of spoiled poi and salmon is the cause of the dysentery which so generally prevails.

It was my fortune to see the arrival of a cargo of lepers, and

here also there was the same absence of proper management; no preparations had been made for their reception. They were simply "dumped" upon the "shore," and left to "shift" for themselves. Some of the young had happily been provided by the Sisters at Kakaako with a letter to Father Damien, soliciting his interest in their welfare. But the rest, if not too feeble to walk, were left to shift for themselves, while a few of the most feeble were conveyed to the hospital. Only that the natives are a kindly and hospitable and a long-suffering race, this total absence of preparation would be an intolerable evil.

It is impossible to avoid the comparison between the care bestowed upon Kakaako, and the neglect of Molokai. Whilst the former is regularly supplied with food, the latter is starved for want of the money which has been appropriated, but is not forthcoming for the first necessities of life. At Kakaako the leper is allowed the society of friends and relatives, and isolation is a sham. Indeed, it is no wonder that the patients prefer the city life to the den of death which has been made for them at Molokai.

It is evident that if the principle of segregation is to be equally, justly, and kindly carried out, and the public properly protected against the contagion of leprosy, Molokai is the most fitting locality where alone such segregation can be made effectual, and where the necessary terrors of confinement might be reduced to a minimum. If the money spent at Kakaako, and the care bestowed upon its management had been spent at Molokai—if the patients at Kakaako had been starved to death, imprisoned, and neglected, like those at Molokai—it is possible that the inmates, instead of resisting removal, would have prayed to go away. But the absence of proper administration appears at other points. I saw two men accused of robbery who have been confined in prison for upwards of three months without being brought to trial. They were confined in one cell eight feet by five feet in size, and about ten feet high. Their cell is ventilated by a barred opening over the door twenty inches by ten inches. Both men are lepers, and as the door opened the foulness of the air was evident. These men have been advised to confess, and restore the stolen property, when they will be given liberty. After our visit, they endeavored to implicate another party. But this sort of trial by fortune merely indicates the necessity of police and the appointment of some person competent to act as a justice of the peace.

To conclude, it is to be observed that this same neglect hangs over improvements admitted to be essential to the well-being of

the Settlement. A further water supply is necessary; \$10,000 was appropriated for the purpose, and nothing has been done. The landing places are always dangerous, and sometimes useless. Steamers conveying passengers and supplies have remained at anchor, and have been obliged to return to Honolulu without discharging cargo. This might happen whilst the lepers were absolutely in want of necessities, and yet appropriations have been made without result. The approach by the pali is also in a shameful state; cattle are continually killed upon it. No such difficult pass is necessary to confine the leper, and to prevent communication; and it seems monstrous that this dangerous path is not improved.

It is by good sanitary organization, and better sanitary administration, that we raise the standard of public health, and enable the people to resist and throw off the beginnings of disease. Then by such means we may hope that the germs of leprosy will fall harmless in our midst, and the necessity for leper settlements shall cease.

Your very obedient servant,

(Signed) J. H. STALLARD, M. B. L.

Member of the College of Physicians, England, etc.

REPORT OF DR. EDWARD ARNING

Honolulu, H. I., November 14th, 1885.

To His Excellency W. M. Gibson,
President, and Members of the Board of Health.

Sirs:—At the request of the president of the Board, I furnish you with a report as to the course of investigation carried on by me with regard to leprosy.

The general headings, under which the work is being conducted, may be classified thus:

- I. Clinical.
- II. Morbid—Anatomical.
- III. Special Bacterial Research.
- IV. Therapeutic.
- V. Hygienic.

All these different classes of work have had an even amount of attention bestowed on them, which I will try to outline in the following, without of course going into details, which have found, and will find, their place in medical publications.

I. The clinical work embraces: Inquiry into the general historical features of the disease, and into the history of the disease in the individual. I have here encountered great difficulties, and am afraid have wasted time and patience in trying to derive reliable information from the Hawaiians. Lack of observation of their personal health and wilful deceit are so mingled with truth in their statements, that I defy anybody to collect reliable statistics, such on which it might be possible to base proofs for hereditary or congenital transmission of leprosy on these islands. Of course, I do not deny that good anamneses may be obtained in some cases, but to base theories on this kind of evidence alone must assuredly lead to fallacy.

The second part of the clinical work pertains to the symptoms of leprosy, as we find them on these islands, and their similarity, or dissimilarity, to the symptoms described in the accounts of observers at other times, and in other localities. The practical drift of this comparative symptomology, as I may term it, is perhaps, not quite obvious, although none the less important. All endemic and epidemic diseases are apt to modify their character and appearance with time and circumstance. General experience

goes to show that milder forms follow the more malignant type, and may be welcomed as indications that the disease has reached its acme. Certainly this applies more strictly to epidemics of acute character, but due allowance being given for time, it holds good also for the chronic infectious type of disease.

Now, there seems to me to be no doubt that a great number of cases are to be found on these islands which present, and often have presented for years, one or two symptoms of leprosy, mostly belonging to the group of leprous nerve lesions. I style these cases abortive leprosy, and I venture to hope that they may be hailed as signs of a decrease of virulence of the disease in general. I have bestowed particular attention on the symptoms of these initial and abortive cases, as the diagnosis of leprosy is, of course, a terribly severe one, and more liable to be disputed in these cases than in the advanced stages. Full notes have been taken of all these cases, and will be of importance in a number of years hence, when I shall try to gain new information about them, and see whether the leprous virus was only dormant in them, or actually exhausted. Of the value of these cases for therapeutic action, I shall have to say more hereafter.

A great number of lepers were examined as to the presence or absence of the bacillus leprae. The results I summarize as follows:

1. The bacillus is found plentifully in all nodules of the tubercular cases, and likewise in the diffused swellings of the skin in the tubercular cases.

2. It is found in similar quantity in the nodules and diffused infiltrations of *the mucous membranes of the mouth, throat, nose, rectum and large intestine.*

3. In case of softening and breaking down of these nodules, the bacillus is mixed with the discharge in great quantities. The presence of sores in the mouth, throat, and nose causes *large numbers of bacilli to be contained in the saliva*, and the mucous discharge from the nose. In leprous diarrhoea which closely simulates dysentery, but which I have been able to trace to leprous, not dysenteric ulcerations of the bowels, I have been able to detect the bacillus in the faeces.

4. In the so-called anaesthetic cases, the bacillus is not found in the anaesthetic patches, nor in the chronic sores of necrotic parts of skin, tissue, and bone; but as nerve excisions have proved to me, in the nerves supplying these mutilated parts with vitality.

5. The bacillus cannot be found in the bright red patches, so frequently ushering in the first formidable attack of the disease

and mostly occurring on the face. These patches are always located in the distribution of some larger nerve and are seats of local vasomotoric congestion, based on leprous disease of this nerve.

6. The bacillus cannot be found in the urine of lepers, which is accredited by the Chinese to be the infection-carrier "par excellence."

7. The bacillus as such *cannot* be found in the blood, not even during the febrile attacks marking the progress of the disease. As it has of late been asserted by different observers that the blood contains the germ, particular care has been bestowed on this point. Their statement must be due to the fact that in obtaining a drop of blood for examination, the bacilli have got into the blood by not carefully selecting a healthy spot of the skin in pricking for blood, but going through diseased tissue and getting some of the bacilli contained in this tissue mixed with the blood.

For all that, *the germ may be contained in the blood, more especially during the febrile attacks*, possibly in some hitherto unknown, but suspected form of spore-condition, a stage of the life of a bacillus. These suspected spores may not be visible either on account of their minuteness or which is more likely, on account of our inability to make them visible by the staining methods we use in searching for bacteria.

As this is a most important point for the whole question of the spread of the germ, I have applied myself most assiduously to its investigation by devising new staining methods and employing the highest magnifying powers at our command, also by culture experiments with blood taken from lepers during their febrile attacks, with the idea of making the spores which I consider it likely to contain, grow into fully developed bacilli and become visible as such.

At present I must confine myself to the statement that *the blood* of lepers, if taken with all due precautions, does *not* contain the bacillus.

It has been noted before by Danielssen and Boeck, the Norwegian observers, that leprous ulcerations of the nose occur in anaesthetic cases, which otherwise present no ulcerations. I have met with this peculiar condition in two cases. One that of a Portuguese who had brought the disease with him from the Azores, and the other that of a young Hawaiian girl. These cases being otherwise not very advanced, and decidedly not repulsive looking, were discharged from the branch hospital. But I must consider these cases a great deal more dangerous than their general appear-

ance would lead to believe. I was surprised to find in both cases the discharge from the nasal sores full of the bacillus.

Next to this microscopical work in relation to the clinical aspect of leprosy, my attention was directed to the peculiar features of leprous anaesthesia and paralysis. They have been examined under the heads of distribution, intensity, and mode of progress, and as to their spinal or peripheral origin. For these particulars we have to rely mainly on the modern teachings of electro-diagnosis. Let it suffice to say here, that I consider all these troubles due to leprous disease of peripheral nerves, and that I believe the distinctions found in this respect between leprosy and the great number of other diseases of the nerves, spinal cord and brain, will enable us to pronounce with more confidence on the nature of what it is here customary to call suspicious cases.

The different appearances of muscular wasting and contraction have been studied in comparison to similar symptoms of other neurotic diseases. The advanced, or I may say, completed stage of this muscular derangement is not so very far different from similar troubles due to other nervous lesions, such as rheumatic, diphtheritic, traumatic, etc., whereas the beginning presents more salient features, which will with due regard to accompanying symptoms enable us to specify the particular disease as leprous or not.

But this muscular crippling being largely due to mechanical causes, is decidedly not as characteristic as the bone disease of leprous origin. The mode of attack, the privileged seats of caries and necrosis, and the resulting crippling, are decidedly one of the most peculiar features of leprosy, and most strikingly different from bone disease, due to osteomyelitis of syphilis and tuberculosis. As such, they claim a particular share of our attention, more than they have hitherto found.

A large number of photographs and plaster casts have been taken of cases, selected at Kakaako and the Molokai Settlement to substantiate these experiences, and to serve as illustrations for future publications.

A certain amount of attention and study have, furthermore, been accorded to diseases of more external nature, presenting any resemblance to leprous lesions, and occurring both independently and in company with leprosy. As such, I mention pigmentary and parasitic skin diseases. A very troublesome affliction of this nature, unknown to the Hawaiians, has been introduced by the Gilbert Islanders, among whom it is quite common. I have seen a pure

Hawaiian, who is married to a Gilbert Island woman suffering with it. He had been subject to it for years, and was looked upon by some as a suspicious case of leprosy, but I have since been able to cure him entirely with simple applications of chrysophanic acid. The true scabies, or itch, due to the insect "*Scarcoptes Hominis*," is exceedingly prevalent at Molokai, and will be hard to eradicate there under existing conditions, just as we are not able to eradicate it in large cities. I have successfully stamped out a small epidemic of it at Kakaako, and great watchfulness will be further needed. Only quite recently a hideous looking case of tubercular leprosy, in a seven-year-old boy, was brought to the branch hospital. A great part of his hideousness was due to inveterate itch, and this trouble caused him a great deal more pain and discomfiture than his leprosy. It was, of course, easily cured, and had to be done at once on account of its eminent contagiousness.

In the foregoing I have attempted to outline the clinical part of my work. In case the Board desires it, I will condense the results into the form of a schedule, which may serve as a guide for examination of doubtful cases.

II. Morbid—Anatomical Work. Here I can confine myself to closer limits. I have been able to make seventeen post-mortems of lepers, which have given me much valuable opportunity to study the anatomy of the disease, and have enabled me to make some important discoveries regarding the diffusion of leprosy through the internal organs. For this reason I deeply deplore that lack of support by the Board has put a stop to this most intrinsic part of my work since last spring.

In all advanced tubercular cases, I was struck with the extreme frequency of grave changes in the larger viscera, more especially the lungs, liver, spleen, and bowels. These organs presented an aspect quite new to me, and closer examination of their tissues has enabled me to prove that we have been mistaken in attributing deaths to lepers to inter-current pneumonia, tubercular phthisis and dysentery, which were stimulated by the clinical symptoms. The ulcerations of the bowels and the breaking down of lung tissue are due to leprous infiltrations, and we shall have to modify our opinions of leprosy, being mainly, a disease of the cutis and peripheral nerves and introduce terms such as phthisis leprosa and enteritis leprosa, etc.

As far as the brain or spinal cord were examined, I found them unaffected, but they will yet have to find a very close and searching microscopical scrutiny. This applies generally to all the

material collected from the post-mortems and preserved in different ways.

III. The bacterial research, i. e., the question of etiology of leprosy, is another essential part of my investigation, and at the same time the most subtle and delicate. No one who has not tried himself at this particular kind of modern research is able to judge of its many disappointments, its dependency upon apparently insignificant particulars, and the difficulties which crowd upon you when you are working outside of the accustomed laboratory with its always handy intelligent help and never-failing supply of requisites.

The outline of experiments embraces:

1. Search for the germ of leprosy in the air, water, and food.
2. Attempts to breed it outside of the living organism on artificial soils, employing the greatest variety of composition of soil and different grades of constant temperature.

Of soils I have used:

1. Koch's meat-peptone-gelatines of varying strengths.
2. Gelatines made of seaweed and meat.
3. Gelatines made of seaweed and fish.
4. Bouillons of meat and fish.
5. Sterilized and solidified serum of blood taken direct from the carotid artery of bullocks and sheep.
6. Vegetables, solid and in decoctions.
7. Poi.

After being sterilized, i. e., freed by high temperature (steam and dry heat), from any germs they may accidentally contain, these soils are implanted in sterilized containers with the leprous germ and kept for weeks together at constant temperature in the incubator, and carefully watched day by day.

Until now, the results of this work are altogether negative. Under all the varied conditions, I have not once succeeded in obtaining an independent and pure growth of the bacillus leprae.

Parallel with these culture experiments on artificial soils, a large number of experiments were conducted to grow the germ in living tissue. For this purpose I have procured and inoculated a variety of animals at ages ranging from a few days old to grown-up beasts, rabbits, guinea-pigs, rats, hogs, pigeons, and a monkey. They were inoculated in and under the skin, in the cavity of the abdomen, under the conjunctiva of the eye, in the anterior chamber of the eye, and in the ulnar nerve, mostly with small pieces of leprous tubercule excised under antiseptic precautions.

I have been able to follow up, microscopically, the presence of the bacillus leprae at the spot of inoculation for months after the inoculation, but have *not* in a single instance been able to observe any general symptom of leprosy.

The negative results of all this work are not valueless and discouraging. On the contrary, they act as a stimulus for further research. I am not in the habit of drawing hasty conclusions, especially from negative evidence, but as from well proven analogy with kindred diseases we know that the bacillus leprae *is* the etiological factor of the malady, and as we find it impossible to discover or grow this bacillus outside of the human body, but find it in immense numbers and rapidly increasing in the human body, we are naturally driven to the following conclusions:

1. The bacillus leprae is a parasite limited to the human race.
2. It must be transmitted either directly from individual to individual; or
3. Run through a stage of intermediate life (spore condition) which we are at present unable to detect, for reasons given above, but which may be present in the soil, water or food, but can only get into them from the diseased tissues of a leper.
4. Accepting either theory, the direct or indirect transmission, we must look upon every individual leper, whether in the incipient or advanced stage of the disease, as a dangerous focus of the malady; he multiplying and nursing the germ in his tissues.
5. As every seed requires its peculiar conditions of soil, atmosphere, etc., to allow it to strike, and, when struck, to grow up to be itself a seed-bearing plant, so does the leprous germ require a certain disposition of the human soil to strike and thrive. What this peculiar disposition may be, we are at present unable to say. It is evidently a disposition which may coexist with apparent good health, as many examples of strong, robust men, developing leprosy, show us. This disposition may possibly be transmitted by heredity. I desire not to be misunderstood on this particular point. I do not believe that leprosy itself is in any case congenital; but I do believe that a certain weakness to resist its attacks may be transmitted.

I have hinted at similar ideas in the motives accompanying my application to His Majesty's privy council, to be allowed to perform some inoculation experiments on the condemned convict Keanu. The application I made resulted in the sentence of death passed on the murderer, being commuted to penal servitude for life. With the prisoner's written permission, I commenced operations on

the last day of September, 1884, after having previously made a most searching inquiry as to any leprous taint in his family, and a close examination of his own body. This examination satisfied me that, as far as I am able to judge, no trace of the disease could be found in him at the time. A further step was to insure that the prisoner would not be employed at work outside of the prison walls.

As stated above, I inoculated Keanu on the 30th day of September, 1884, and for the four weeks following, I saw him daily, and after that once a week for several months, a microscopic examination of the inoculation spot being made every time. After that period the convict has been examined by me regularly once or twice a month. The microscope revealed the presence of the bacillus leprae in large numbers until the middle of March, 1885. They have since gradually diminished in number, but a recent excision of a small part of the scar shows them present even yet, i. e., nearly fourteen months after the inoculation.

At the same time there is nothing in the general appearance of the convict which would denote any development of leprosy. Pains in the joints of the inoculated arm, from which Keanu suffered in January and February last, have since disappeared.

To the foregoing I wish to add the following remarks:

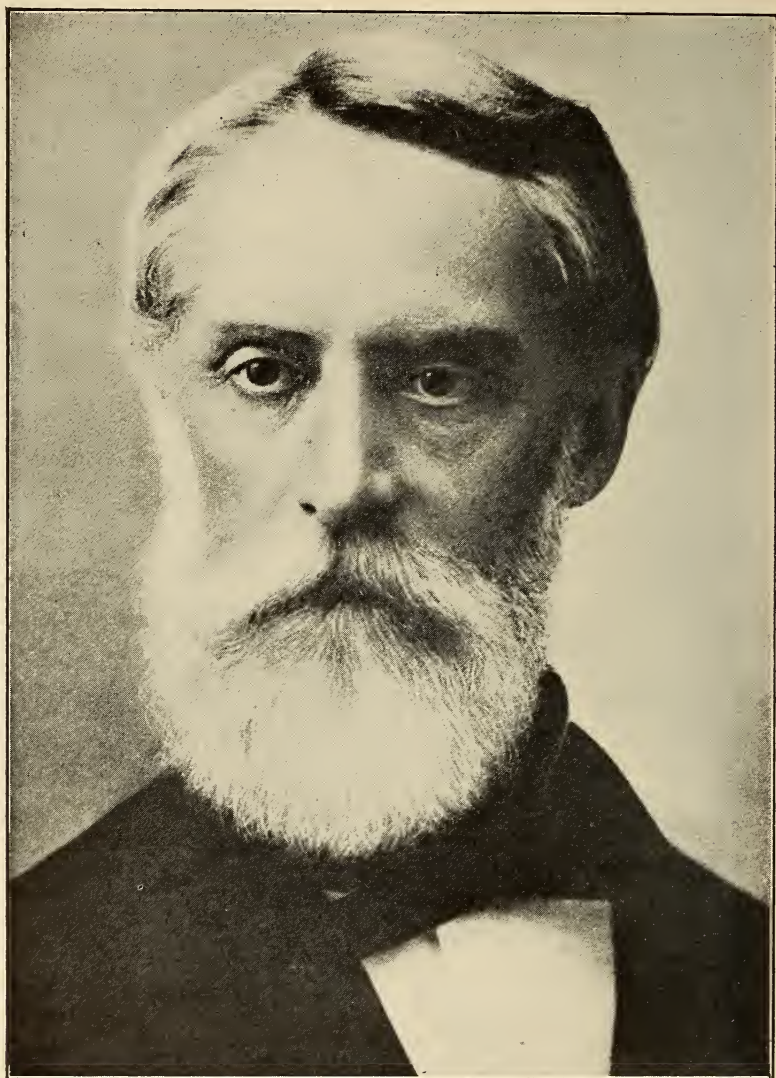
1. I do not consider my experiment with Keanu concluded, or mature for scientific publication.

2. Even if future observation should show us no trace of leprosy developing, we should not be able to infer more from the experiment than that in this case inoculation proved ineffectual.

3. I have given this account of the experiment to Your Excellency and the members of the Board, to allow you to judge of the spirit in which it is being conducted.

4. Moreover, I have been induced to do so by recent perfectly unauthorized publications of Dr. Fitch, in a California medical journal, as a protest against the thoroughly unprofessional conduct with which this author, who could only gain knowledge of my doings in an under-hand manner, has brought my name and work forward in support of his own unproven assertions.

I take the same opportunity to protest against the narrow arguments used by the same author, as far as this subject of inoculation goes. He cites my name, and an ordinary post-mortem blood poisoning which I acquired at the autopsy of a leper as a proof of the non-possibility of inoculation of leprosy. It would be a very bad thing, indeed, if all the cases of common, local, or



CHARLES R. BISHOP.

Banker, capitalist, philanthropist. * Ninety-three years old January 25, 1915. Founder of the Bishop Home for leper girls at Kalaupapa, Molokai, and good friend and generous benefactor to the Hawaiian race.

Husband of the late Chiefess Bernice Pauahi, the foundress of the Kamehameha Schools for Hawaiian boys and girls—the foremost and best educational institutions in the Pacific Ocean.

The contiguous Bishop Museum, with its masterly arranged exhibits, affords unrivalled facilities for study amongst its unique and splendid collection of Polynesian antiquities, etc.

* Died at San Francisco, California, June 7, 1915.

general septic poisoning at a post-mortem should result in our acquiring the disease the patient was subject to.

Vague statements of this nature do not deserve, and would not find an answer from me in a scientific publication, but as they are put forward with the intention of captivating the mind of the general public, and are, as bold and positive assertions, more apt to do so than the often restricted and guarded utterances of calm independent observation, I have given them this brief consideration in my report.

Closely allied to the inoculation question is the subject of vaccination. You are doubtlessly aware of the very prevalent opinion among medical men, that the unusually rapid spread of the disease may possibly be attributed to the great amount of indiscriminate vaccination which has been carried on in these islands. There have, if my information is correct, unquestionably new centers of leprosy developed after vaccination was practiced, and several old inhabitants have told me how they themselves used no precautions whatever in vaccinating during a small-pox scare, but brought the lymph directly from one arm to another, without even wiping either points or lancet.

To bring some light on this moot point, I vaccinated a number of lepers. The vaccination only took in three cases, one tubercular and two anaesthetic. Both the lymph and crust of the tubercular case contained the bacillus leprae; in the anaesthetic cases I could not detect it. As the vaccinations are now conducted by medical men and with bovine virus, it may seem to be perfectly superfluous to dwell any further on this point, it apparently presenting only historical interest. But recent experience causes me to advise the Board not only to supply its medical officers with animal vaccine and points, but also to issue strict regulations as to the manner how this virus is to be used. If the lancet is dipped into the virus, then into the arm, then again into the virus and the next arm, or if points used for one vaccination are re-coated for further use, as physicians of the other islands have, at my special inquiry, owned to doing, then the use of bovine virus gives us no safeguard whatever against the propagation of constitutional disease by vaccination. The main point is the thorough disinfection of the lancet after making one vaccination, and before dipping it into the lymph for the next arm. This is easily obtained by heat—the point of the lancet in a spirit flame to a dull red heat, and it forms a main part of the instructions issued to the government physicians in Germany.

Another point which has been raised is the possibility of the leprous virus being conveyed by mosquitoes. I am at present occupied with investigating this subject. The endemic elephantiasis of the tropics, a disease which is happily unknown here, has lately been traced to propagation by mosquitoes, and by these solely.

IV. The next of my headings is that relating to therapeutics. As this is one of the practical sides of the question, and one in which the general public naturally takes the greatest interest, as it considers it more within its scope than the rather distant etiological and pathological studies relating to leprosy, I beg to be permitted to begin with some general remarks on this subject.

All our therapeutic action may be classed either as specific or symptomatic. Looking upon disease as a weed which grows in the fertile soil of the body, we may say that with the former we aim to strike at the root of the weed, whilst with the latter we only lop its branches and keep its growth in check.

There are very few diseases where we can rely entirely on specific treatment, the most notable being syphilis, malaria and acute rheumatic fever. For these three diseases we possess in mercury and iodine, quinine and salicylic acid respectively, real specific medicines; and if by their aid we have been able to restore a patient suffering from any of these troubles, we may say he has been cured by these medicines. On the other hand, we have a vast number of diseases where we have to rely on symptomatic treatment, i. e., mainly alleviate pain, ward off external danger and keep up the power of the body, so that it may rally to healthy reaction and cast off the disease by its own efforts. This applies to all our acute zymotic diseases, the eruptive fevers, small-pox, scarlatina, measles, etc., to the various typhus fevers, to cholera, dysentery, etc., and very nearly to all chronic diseases, foremost to consumption, the scourge of our age, and as yet to leprosy.

We have no specific for leprosy, nor has any man of any other country or nationality. Scientific medical information reaches too far now-a-days to permit of any agent of this kind being known by an individual and kept as a secret. Anything put forward in that way without being published through the regular channels must be regarded as quackery and nothing else.

Anybody who is read on the subject of leprosy, in fact, any remoter medical literature, will be struck with the amount of attention bestowed on the therapeutic portion in those writings. The tendency of our age is to simplify therapeutic action as much as possible, and not experiment empirically, but bring therapeutics

within the rational limits of physiology, etiology and pathology. There is scarcely a drug in the pharmacopeia, at least scarcely a class of drugs, that has not been most systematically tried in the treatment of leprosy. Over and over again men of sanguine views have found what they called a specific cure, but in every instance calm and unbiased judgment has afterwards pronounced a verdict of uselessness.

How is it that these facts are not accepted, and a different line of therapeutic attack inaugurated?

Let us pay more attention to careful symptomatic treatment of leprosy. Even the advanced cases we can help and benefit a great deal more than is generally believed. The great number of incipient cases will furnish us opportunities enough to try new lines of specific treatment.

Let the scourge this nation is subject to be turned into as much good as possible, and let arrangements be made (for it is not feasible, under the present circumstances) to let at least a limited number of advanced patients be benefited by modern medical and surgical progress. On the other side, let the incipient cases be divided into classes, and treated systematically on different principles, but under one general management and observation.

I beg to refer you to my first report, written for the session of the Legislature of 1884. I have already then dwelt on this point, and, I am happy to say, not without results. My suggestions of a home for suspected and incipient cases, and of regular medical school examinations, have been carried out, and order and cleanliness prevails, where there was an acknowledged bad state of affairs before 1884. But if you ask me whether enough has been done to be able to say to the world that all is being done for the lepers that can be expected, and in a model way for other nations, looking with fervent interest to Hawaii's fight with leprosy, I must say no. The therapeutic side, the treatment is neglected.

I have been told that my views are too advanced. I answer that I am proud of it, and that I consider nothing can be too advanced in the treatment of a question, which has been grappled with for centuries in the old style of isolation and feeding.

What I have repeatedly applied for is a small hospital-ward within the Kakaako enclosure, with, say, no more than six or ten beds, but managed separately from the general Settlement. This hospital should have a nurse and a servant attached to it, and to it exclusively; have arrangements for hot and cold and permanent baths, steam baths, gas baths, etc., and ought to be fitted with all

the necessities of clinical research, and medical, surgical and electrical treatment. The patients would be selected from the general flock, according to the wishes of the physician put in charge of this trial station. Then the journals, which would have to be strictly kept of every case, would be able to contain all that accurate information, without which modern clinical work is considered incomplete, and which it is impossible to gain under existing circumstances. Then electrical treatment, which is undoubtedly of great, even surprising benefit, could be carried on; and surgical operations, such as removal of necrosed bone, stretching of nerves, cutting and stretching of contracted muscles and sinews, and operations on the eye and other important organs, be attempted with more view to success than is possible at present, where no arrangements of any kind are made for all this at the branch hospital.

The therapeutic results I have achieved, under less favorable circumstances than those enumerated did offer, urge me to renew this request.

After these general remarks I will, in a cursory way, state the methods of treatment I have adopted for different classes of lepers, native and foreign, some treated at Kakaako, some as outside patients. Some sixty cases I find in my private books, which I look upon as either fully developed and progressive, or abortive, or incipient, or suspicious cases of leprosy. A number of them have since been received at the branch hospital, a number of foreigners have left the country, others I have lost sight of, and some few I consider so far benefited by continuous treatment, that I might doubt their being afflicted, if I did not find the record of their previous state in my books.

Since about a year, I have found in the external use of salicylic and pyrogallic acid agents of undoubted value for symptomatic local treatment. With them it is possible to destroy leprous tubercles and soften diffused leprous infiltrations, sometimes even to restore a portion of the feeling lost over these infiltrated patches. Especially the conspicuous red patches, which usher in the commencement of tubercular leprosy, and often stand for years without fading, subside readily under local treatment with an ointment or paste containing ten per cent of salicylic acid. Isolated tubercles and serpiginous leprous papules have been entirely removed with a strong solution of pyrogallic acid in traumaticine, or with a ten per cent pyrogallic acid ointment. For the diffused leprous infiltrations I use a ten per cent solution of salicylic acid in oleic acid. Internally I have used either nothing, so as to be sure that the

disappearance of the symptoms was due to the local applications alone, or salicylic acid in large continued doses. I have certainly seen fresh febrile eruptions occurring during this treatment, but in several cases a decided improvement, even when used without any local treatment.

Special reasons induced me to try a very active sulphur treatment in one case. Sulphur was administered internally as hyposulphate of soda, and the patient was subjected to a sulphurous acid gas bath every day for one hour. The more pronounced tubercles of the face were at the same time treated with compression and deep local injections of absolute alcohol, which caused prompt breaking down and cicatrization of the tubercles. This method I have since discarded for the more efficient and less painful pyrogallic acid treatment. I am sorry to say that this patient, whom I had under this treatment for a full year, and who was one of those put under my special charge by the Board, was, like two other patients of this particular lot, removed from the branch hospital without my knowledge. Such steps are naturally not inclined to promote scientific work. In deciding the advisability of their removal I might at least have been asked, and my reasons for retaining them weighed with those which prompted the action of the Board.

The much-abused mercurial treatment has been used both as a general and local application. For the general treatment I have relied chiefly on hypodermic injections of corrosive sublimate, a centigramme of the drug being injected daily. In one case of a well-educated native man, who has been under my treatment for nearly two years, I have given two courses of these injections—one of a hundred, and the next of sixty—without any trouble, although the injections are a little painful. His enlarged ears were treated with excisions and deep scarifications, and an anaesthetic spot on the back and the anaesthetic big toe of his left foot were successfully treated with electricity. The patient now feels that he has regained his lost strength and mental activity, looks hale and hearty, and would pass very close scrutiny without being considered in any way suspicious. For all that I do not for a moment pretend to have effected a lasting cure—that remains for time to prove—nor do I feel inclined to let the patient go without further treatment, though he is apparently in vigorous health. He is at regular periods taking small doses of mercurials, and should go on with this for a number of years.

In another case of rapidly progressing mixed form the quick

course of the disease has changed to a slow progress after eighty hypodermic injections of corrosive sublimate. I am sorry to say that this is one of the cases taken out of my observation at the branch hospital. The anaesthetic and contracted hand was steadily improving when I was treating it electrically at my office. This had to be discontinued when the patient was removed to the branch hospital, no appliances for this purpose being provided for there. Since her dismissal she is under no treatment whatever, but, as I hear, in the family-way, and losing the improvement she had gained in her hand.

In other outside cases I have used creosote and carbolic acid treatment, the former in pills of which Dr. Hillebrand speaks very highly, the latter as hypodermic. Only in one case did I see marked effects. In this, local injections of a five per cent carbolic acid solution were used, and restored color and feeling in a white anaesthetic spot on the cheek.

Iodide of potassium failed entirely at my hands.

Electrical treatment was used in quite a number of anaesthetic cases, and when persevered in long enough proved very efficient. One patient especially, a white man, who had several anaesthetic patches on the arms, has recovered entirely. He has at the same time been taking from $1\frac{1}{2}$ to 3 grammes of salicylate of soda daily for a whole year. Another patient, a native woman, who had, besides other symptoms, a nearly complete anaesthesia of the left arm and contracted useless hand for over ten years, is now enabled to stretch her fingers and use them for needle work, the feeling being completely restored in two of the fingers. The treatment in her case has extended over very nearly eighteen months, and very high doses of arsenious acid, up to nine centigrammes daily, have been taken internally, the patient standing this drug extremely well, whilst from some other experiences I have learned to be extremely cautious with this drug in the treatment of leprosy.

The very distressing symptoms of the nose, mouth and throat, which are in the general run of the treatment of leprosy all helped to a gargle and nothing more, deserve especial attention for several reasons:

1. There is nothing so apt to run down the appetite, and with it the general health of the patients, as the continual swallowing of putrid matter from festering sores of these parts.
2. The discharge from these sores containing the bacillus in great numbers, as stated above, there is sufficient ground to believe that like in similar cases of tuberculosis, the leprous ulcerations of

the bowels are caused by self-infection from swallowing the pus secreted from these sores.

3. The heavy breathing and hoarseness, the disgusting smell and the ever-abundant secretion makes these patients doubly loathsome and dangerous.

My experience teaches me that these ulcerations are especially amenable to local treatment. The daily application of antiseptics, caustics, and astringents, as the case may require, the fixing of ointment tampons, the use of medicated sprays and steam inhalations, all this can be used with much success, and ought to be used in a hospital for lepers.

Similar arguments relate to the treatment of the disease of the eye so common in leprosy. I firmly believe that early operation for leprous nodules on the conjunctiva, and for leprous iritis will rescue a large number of the unfortunates from irretrievable blindness, and the paralytic drooping of the lower eyelid, which so commonly leads to loss of vision in leprosy, may just as well be benefited by plastic operation as it is in facial paralysis from other causes. But to effect all this, and a great deal more which I will not detail, there is required good-will on all sides. On part of the physician it must be brought, and on part of the patients it will have to be courted and enforced by more vigorous support of the medical work by the Hospital Board, working in concord, and with the advice of the hospital physician.

I now draw to the close of this report with a few remarks as to

V. Hygienic Measures. I will skip the commonplace, but nevertheless all-important subject of general sanitation and improving the social habits of the people, but try to give some more definite points.

Traveling around the islands to gain information on these subjects, I found in some parts, especially so in parts of Kauai and Maui, more lepers at large and in unconstrained intercourse with the healthy population than ought to be under the present laws. Now, I do not think it possible for the government to take charge of all lepers, but as long as the powerful law of segregation is in force, let it be brought to bear on such cases which are really complained of as public nuisances. I have intentionally visited the remotest gulches and corners where few white men penetrate, and have found more bad cases of leprosy than I expected. Perhaps it may be just as well to leave these poor wretches in their homes, where they are just as much or more out of the way than at Kakaako or

Kalaupapa; but there is an important point to consider. Pent up with these bad cases in their squalid huts and houses are apparently healthy children. These ought to be removed, for they are the future and hope of the nation. And not alone the girls, but also the boys should be removed, especially so as old and new statistics point to a prevalence of leprosy among the male sex.

But one thing must be avoided if we accept the theory of disposition in children of leprous parents. We must keep these out of harm's way even more carefully than other children whose families are free of the taint.

I know that it is acknowledged by Your Excellency and the members of the Board that the present Kapiolani Home is not in its proper position, and that only the most pressing circumstances have necessitated the selection of the present site.

From my point of view I must stand by my original proposal to have the Home out of sight and reach of the leper asylum. If we want to keep the possibly disposed systems of the children free from the disease, the first step should be to remove them as far as possible from it, and not to tabu them within the walls of a lazaretto.

The next point touches the vaccination question, with which I have dealt at length under the heading of experimental work. I would further urge that the medical examinations of school children, which has led to the elimination of quite a number of cases, should be kept up regularly and carefully. As an instance of their necessity, I may quote a case which has quite recently come under my observation. A little girl (native) belonging to one of our large schools passed my close examination a year and a half ago as healthy, but now presents initial symptoms of leprosy. We must not rely on general healthy appearance in these examinations, and on a furtive glance at hands and arms. I have found unmistakable marks of leprosy on the back of a child that held a recent health certificate. Moreover, we shall have to extend our examinations even to very young children in spite of Dr. Fitch's assertion that leprosy does not make its appearance before the period of second dentition. I have seen a child with clear signs of leprosy at $3\frac{1}{2}$ year of age, and know of another boy who was a marked case at four years old.

As this country has to rely on immigration mainly coming from countries where leprosy is endemic, i. e., China, the Azores, and Japan, considerable care ought to be exercised in guarding against new cases of the disease being imported from there. I know



BERNICE PAUHI BISHOP.

High Chiefess or Alii, wife of Charles R. Bishop.
Born December 19, 1831. Died October 16, 1884.
FOUNDRRESS OF THE KAMEHAMEHA SCHOOLS

of two unquestionable cases of leprosy having come here from the Azores—the one was the Portuguese man mentioned above, the other a young Portuguese girl who, immediately after her arrival, half a year before I was asked to examine her, obtained a position as nurse in one of our best families.

Altogether it is deplorable, though perhaps inevitable, that these islands with their terrible abundance of leprosy should be repopulated by the very nationalities, who seem to have not yet overcome a disposition to the disease as much as other races.

There are two more points I wish to bring again before you, one of more local, the other of general and scientific importance. Both have been subjects of previous memoranda to the president of the Board.

The first applies to the necessity of furnishing a wash-house at the Kakaako hospital to obviate the certainly unpermissible practice of some of the lepers sending their soiled clothing out to be washed.

The other relates to the disposal of the dead bodies of lepers. To make this report complete, I shall here insert the text of my previous communication, sent to the president of the Board in June last:

*To His Excellency W. M. Gibson,
President of the Board of Health.*

Sir: I beg to submit to Your Excellency's consideration the following facts, which I have recently discovered with regard to the power of resistance of the germs of leprosy to putrefaction. I communicate this result of my work immediately to you, because it seems to me to have a direct practical bearing towards public sanitation.

A series of experiments in this line were commenced in October, 1884. Leprous tissue and matter was set aside under conditions of temperature and moisture most conducive to slow and thorough putrefaction, whilst the growth of the larger fungi was at the same time carefully excluded. From time to time a microscopical examination was made, and the characteristic bacillus leprae was not only found to hold its own against the germs of dissolution and putrefaction of albuminous matter, but met with so abundantly and laden with spores that the idea suggested itself there might be actual increase. An examination made a few days ago of the remains of this leprous tissue, set aside fully eight months ago, shows it to consist nearly entirely of swarms of the bacillus leprae;

closely packed. Every vestige of the cellular and fibrous structure of the tissue has disappeared, even the bacteria of putrefaction have crumbled up into a mass of detritus, but the bacillus leprae is there with all its peculiar microchemical reactions.

The discovery prompted me to examine dead bodies of lepers under the ordinary and natural influence of decomposition. Not being able to acquire the desired corpse here, I went to Molokai, and succeeded in procuring parts of the body of a tubercular case, which had been buried for nearly three months, and was in the most active state of putrefaction. After what I had learned from my experiments, I was not surprised to find the leprous germ present in large numbers.

I candidly admit that I am not yet able to give a decisive answer to the question, whether these germs are alive and capable of reproducing the disease. This final question will not be solved until we have been successful in artificially cultivating and inoculating the germ, a result which none of us who are engaged in this question, have as yet achieved. However, I feel personally confident, from the microscopical evidence alone, that they have not lost their power of germinating under the above named conditions. At any rate, it seems to me desirable to effectually bar even the possibility of a spread of the disease, through the slow decomposition of the dead bodies of the lepers in the graveyards surrounding the town. Cremation would certainly be the surest safeguard, but, as that can hardly be achieved, I suggest the compulsory filling up of the coffins containing the corpses of lepers with quicklime. To secure this end, I deem it necessary to stop the practice of letting friends and relations take away the dying lepers to their homes, as has recently been done in several cases.

* * *

Thus far goes my previous communication on this subject.

Let me close these observations and suggestions relative to the hygienic side of the question with the following general appeal. Increasing familiarity with a signal danger lessens our fear of it, but not the danger. This applies most pointedly to our relations with leprosy. We live amongst it, and there are many of us, not only Hawaiians but also foreigners, who have grown so accustomed to it that they not only do not heed it themselves, but by word and deed try to dispel the fears of others. This is all very well, and has its good side when it becomes necessary to dissipate a scare. But as long as this is absent it will be a good thing to sound a warning note from time to time, so that carelessness on

part of the population may not be the outcome of assurances of safety. Examples like those of Father Damien, who has now himself become a leper, and as such a veritable martyr to his cause, and of other worthy and pure members of the community whose names I am not authorized to mention, should teach us a lesson, and cause us all to work harmoniously and united for the one good end, to confine the dreaded leprosy to its closest limits, and to help and support the poor afflicted ones with the best of our will and skill.

I have the honor to remain,

Yours most respectfully,

(Signed) ED. ARNING, M. D.

COPY OF CORRESPONDENCE BETWEEN
THE BOARD OF HEALTH AND
DR. EDWARD ARNING.

Office of the Board of Health,
Honolulu, Nov. 30, 1885.

Ed. Arning, M. D.

Sir: By instruction of His Excellency Mr. Gibson, the president of the Board of Health, I have the honor to acknowledge receipt of your report as to the course of investigation carried on by you with regard to leprosy, dated Nov. 14, 1885, addressed to him and to the members of the Board of Health, and am furthermore instructed to make the following remarks for your consideration and attention.

In the month of February of the present year, His Majesty's government, through the foreign office, addressed His Majesty's accredited representatives abroad, a series of questions somewhat similar to those propounded by the Royal College of Physicians of London in 1862, to medical representatives of foreign powers in whose borders leprosy exists, or is suspected of existing. To these questions His Majesty's government has received interesting and valuable replies in many instances. It is proposed to print these reports in conjunction with your report and other material of value in the study of leprosy. His Majesty's government deeply appreciating the good-will shown by other nations in collecting and forwarding, at no little cost of time, labor and money, the information required, is naturally anxious to reciprocate to the best of its ability by furnishing to such foreign powers all the information the Board of Health can obtain in regard to leprosy as it exists on the Hawaiian Islands.

It is reasonably considered that after the two years you have spent on these islands in the service of the Board of Health with liberal emolument, combined with your high recommendations to the Board as an honorable scientist and close and faithful student, and the facilities and opportunities it has placed at your disposal for experiment and observation, you have been enabled to acquire knowledge and information in regard to leprosy of great value and importance to the health authorities of the kingdom, and to all interested in the study of the disease. The impression is therefore felt that it is within your power to present a report of value and benefit to those engaged in battling with the disease abroad; credi-

table to this State and honorable to your talent and your position as the government's special medical representative.

I am not instructed to make any comments upon the report of Nov. 14th, further than this, that in the opinion of His Excellency the president of the Board, it is incomplete and inconclusive, and not such a one as might be anticipated after two years of special labor, with considerable outlay of public funds.

I am instructed to speak of the report as incomplete by reason of references in it to notes and data not presented to this honorable Board with the report, but mentioned as being retained or intended for "future publications;" and, furthermore, to request that you furnish to the Board by way of schedule or appendix, the schedule referred to on page 12 of the report to "serve as a guide for examination of doubtful cases." It is also deemed proper that the "full notes," referred to on page 4, should be presented to the Board. On page 10 reference is made to photographs and casts of cases selected at Kakaako and Molokai, the president expects that duplicates of these be placed in possession of the Board—allowance being made for any extra expenditure on your part—and, also, the notes of autopsies made by you on hospital cases should be given for future medical reference.

On page 32 occurs this: "I will, in a cursory way, state the methods of treatment I have adopted for different classes of lepers, native and foreign, some treated at Kakaako and some as outside patients." The president is of opinion that the notes of such cases or some of them would materially add to the scientific value of your report abroad, and should be furnished.

On page 40 reference is made to your "traveling round the islands," in search of information, and also to the large numbers of lepers on Kauai and Maui, "in unconstrained intercourse with the healthy population."

The president will be pleased to receive more definite information on these matters, for the consideration of the Board.

A more extended notice of the large body of leper patients whom you have visited on Molokai could not fail to be of interest.

Having outlined the views of His Excellency the president for your consideration,

I have the honor to be, sir, your most obedient servant,

FRED H. HAYSELDEN,

Secretary Board of Health.

Honolulu, Dec. 15, 1885.

*To His Excellency W. M. Gibson,
President of the Board of Health.*

Dear Sir: I am in receipt of the letter of the secretary of the Board of Health, dated Nov. 30th, and regret that my report on the progress of my investigation of leprosy is unsatisfactory to Your Excellency.

I will beg to state, that after due consideration, and after having submitted my report to some of my medical friends, viz., Doctors Trousseau, McKibbin and Brodie, I cannot modify it or make a more extensive one. My friends and myself are of opinion that as information for "a lay Board of Health," it is as complete and conclusive as necessary.

It is far from my desire to have, for the present, a full scientific report published, as my investigations are not nearly completed, and will probably take many more years to allow me to come to positive conclusions.

Footing on the preliminary correspondence between Your Excellency and Dr. Hillebrand, and our own conversation after my arrival, I could not look upon the moderate salary allowed me by the Board otherwise than as an assistance and encouragement to purely scientific work; but never for a moment understood that either my work or notes, or specimens, etc., could be claimed by the Board for its own purposes. The above were mostly obtained at my private expense and for my private use, and, therefore, I must decline to furnish duplicates or put at the disposal of the Board my private notes of cases and post-mortems, these being collected for future scientific information and publication.

It is unnecessary to say that in these latter due credit will be given to the Hawaiian government for all assistance rendered to me.

I have, however, keenly felt that this assistance was not such as I was led to expect from the above-mentioned correspondence, especially as far as moral support was concerned.

I further beg to state that I did not visit the lepers on the other islands with the intention of gathering information for the Board of their whereabouts, but for my own private knowledge, to be able to judge of the causes of the continued spread of leprosy, in spite of segregation. The finding and segregating of these cases is a duty devolving on the police and local government physicians.

I have the honor to remain, yours respectfully,

ED. ARNING, M. D.

Office of the Board of Health,
Honolulu, Dec. 22, 1885.

Ed. Arning, M. D., Honolulu.

Sir: By the instructions of His Excellency the president of the Board of Health, I have the honor to inform you, that by a recent resolution of the Board, a special committee was appointed to make such reduction in the medical staff of the government as they deemed advisable; and, acting under this authority, it has been decided to discontinue your services on the staff.

Your statement to the president, in your letter of the 15th instant, that it will take you many years to come to positive conclusions in your medical investigations; that you never understood that your work, or notes, or specimens could be claimed by the Board, and as you decline to furnish duplicates, or place at the disposal of the Board any notes of cases or of autopsies—all these being collected, as you state, for future scientific information and publication—satisfies the Board, after the expenditures made on your account, of the propriety of their action in this matter.

Your appointment as a physician, in the employment of the Board, will cease on the 31st instant; and between now and that date you will vacate the offices situated in the Kakaako hospital enclosure, now used by you, leaving therein such articles as have been supplied to you by the Board.

I have the honor to remain, sir, your most obedient servant,

FRED H. HAYSELDEN,

Secretary of the Board of Health.

* * *

Honolulu, Dec. 28, 1885.

Fred H. Hayselden, Esqr.,

Secretary of the Board of Health.

Sir: I have the honor to acknowledge receipt of your letter dated December 22, 1885, informing me of the decision of a special committee of the Board of Health to withdraw my appointment as a physician in the employment of the Board, by the end of the month.

The premises I have used for my work at Kakaako will be vacated by the 31st inst. I shall leave therein such articles as have been supplied to me by the Board.



“HALEAKALA.”

Residence of the late Charles R. Bishop and his wife Pauahi. This landmark is no more; it was dismantled some twelve years ago. The location today is King street, near Fort, Bishop Park; the house stood contiguous, and to the south of the new Wilcox Building. The person seated on the lanai, is the late Charles R. Bishop.

I shall draw my salary of \$150 for December, on the 31st inst.

I furthermore claim the payment of my expenses connected with my return to Germany, which His Majesty's government agreed to defray, and which I figure at five hundred dollars.

I have the honor to remain, sir, your most obedient servant,

ED. ARNING, M. D.

* * *

Copy of correspondence between Hon. C. R. Bishop and others, and the president of the Board of Health, in regard to Dr. Edward Arning.

Honolulu, January 28, 1886.

*To His Excellency W. M. Gibson,
President of the Board of Health.*

Sir: A number of the physicians of Honolulu, and many other gentlemen resident here, consider it of very great importance that the investigation by Dr. Arning, applying to leprosy, should be continued in a thorough manner for a further period of two years; and believing that the Board of Health will be not only willing, but quite desirous, of co-operating in a work which may be of inestimable advantage to this country, and of value to the cause of science and humanity the world over, by granting such facilities and moral support as are and may be within its power, the undersigned, a committee appointed by the subscribers to a fund in aid of such investigation, are authorized to assure Your Excellency that if such support and facilities as are necessary are granted by your Honorable Board for the period above stated, the salary of Dr. Arning will be paid from said fund.

Herewith we enclose copy of a communication, signed by a number of the prominent physicians of this city, expressing their views upon the matter in question.

Hoping for an early and favorable reply to the foregoing proposition, we have the honor to be,

Your obedient servants,

CHAS. R. BISHOP,

F. A. SCHAEFER,

J. B. ATHERTON.

(COPY)

*To Messrs. C. R. Bishop, F. A. Schaefer, and J. B. Atherton,
Members of the Committee of the Leprosy Investigation Fund.*

Gentlemen: The undersigned, members of the medical profession residing in Honolulu, have learned that it has been decided by the Board of Health to discontinue the appointment of Dr. Arning as physician in charge of leper patients in the branch hospital at Kakaako, and that the reason alleged for such removal is the necessity for retrenchment in the expenditure of the Hawaiian treasury.

We consider that it is advisable, for the benefit of natives as well as foreigners, that the study of leprosy and the causes associating for its spreading should be continued.

Dr. Arning having come to this country for the express purpose of investigating in a scientific manner the causes of the spreading of this horrible disease, and being so well qualified for that work by study and experience, and so well equipped with instruments, we are of opinion that his removal and the consequent interruption of the important work in which he has been hitherto engaged, will be little short of a public calamity, and will produce most unfavorable criticism in all other civilized countries.

We therefore hope that it may yet be possible to induce the Board of Health to reconsider its action, at least so far as to allow him all necessary aid and facilities for thorough and continuous experiments and investigation, and that you may be able to guarantee the payment of Dr. Arning's salary for two years without calling upon the Board for any help in that matter. It is a duty which we owe to our profession and to the public to make this statement, and to record our conviction that a grave error would be committed by any interruption of the investigations which Dr. Arning has conducted during the past two years.

We remain, gentlemen, respectfully yours,

G. TROUSSEAU, M. D.
JOHN BRODIE, M. D.
JNO. S. MCGREW, M. D.
N. B. EMERSON, M. D.
MRS. DR. EMERSON, M. D.
ROBERT McKIBBIN, M. D.
CHARLES T. RODGERS, M. D.
G. H. MARTIN, M. D.
S. G. TUCKER, M. D.
HENRI G. MCGREW, M. D.

Office of the Board of Health,
Honolulu, January 30, 1886.

To Messrs. C. R. Bishop, F. A. Schaefer and J. B. Atherton.

Gentlemen: His Excellency, the president of the Board of Health, has instructed me to acknowledge the receipt of your letter (and its enclosures) of January 28, 1886, in which you state that: "A number of the physicians of Honolulu, and many other gentlemen, resident here, consider it of very great importance that the investigation by Dr. Arning, applying to leprosy, should be continued in a thorough manner for a further period of two years; and, believing that the Board of Health will be not only willing, but quite desirous of co-operating in a work which may be of inestimable advantage to this country, and of value to the cause of science and humanity the world over, by granting such facilities and moral support as are and may be within its power, the undersigned, a committee appointed by the subscribers to a fund in aid of such investigation, are authorized to assure Your Excellency that if such support and facilities as are necessary are granted by your Honorable Board for the period above stated, the salary of Dr. Arning will be paid from said fund."

In reply, I beg to say, on behalf of the president of the Board of Health, that the past history and conduct of His Excellency, in connection with the disease of leprosy on these islands, have proved his sincerity, energy and anxiety in the matter of dealing with it, both as a legislator and as a minister. It is, perhaps, unnecessary to remind you, gentlemen, of His Excellency's successful efforts to induce the legislature of 1878 to grant the appropriation of \$10,000 for the medical scientific investigation of leprosy, or that it was at His Excellency's own suggestion, and by his correspondence with Dr. Hillebrand, and his own personal influence and exertion, that Dr. Arning himself came to this country to pursue his studies and experiments as a medical scientist, under the patronage of the Hawaiian government.

It is, perhaps, equally unnecessary to refer, upon this occasion, to other practical measures for the benefit of the leprous sick of the kingdom, which have been initiated and carried out by His Excellency and his colleagues, except to enable you, gentlemen, to bear in mind that His Excellency's endeavors, in the interest of the lepers and the public health generally, are unwearying and unabated.

In regard to the decision of the Board of Health "to discontinue the appointment of Dr. Arning," I would beg to recall to

your memories the following extract, from a portion of a letter from Dr. W. Hillebrand to His Excellency, dated Necember 16, 1882, and published in the report of the Board of Health to the Legislature of 1884: "That in consideration of the important results from the intended investigation on the contagium of leprosy, the Hawaiian government declares itself ready to assist Dr. Arning, either by a direct grant or otherwise. The sum in question is very moderate, simply large enough to cover the expenses of living on the islands for the space of nine months. I imagine that you will be justified to set aside a small portion of the money appropriated by the Legislature for sanitary purposes. If not, you can appoint him physician to the Leper Settlement, where Dr. Arning will be obliged to spend the greater part of the time."

Dr. Arning arrived in Honolulu the 8th of November, 1883, and has received from the Hawaiian government a salary, as a government physician, of \$150 a month since that time, altogether with sundry outlays in connection with his experiments, making an aggregate of over four thousand three hundred dollars (\$4,300). The period contemplated for his proposed investigations, and the cost thereof, have, as you gentlemen will readily observe, been considerably extended, in the hope of securing tangible results in the cause of medical science.

His Excellency, consequently, after the lapse of so much greater time than was originally anticipated, and the very liberal expenditure of public monies, desired to obtain from Dr. Arning such a report of the progress of his labors as would give to the incoming Legislature some strong evidences of justification for the expenditure, be an indication of future requirements and appropriations, and an aid to the consideration of the ultimate value of such investigations to the Hawaiian people and the world at large, and the outlining of the course to be pursued in connection with them, by co-operation, development or otherwise.

Upon the receipt of Dr. Arning's report by His Excellency in November last, a correspondence (of which printed copies are enclosed) ensued, which terminated in the Board of Health discontinuing Dr. Arning's services. Retrenchment was not given as a reason, as this correspondence plainly shows; and, as a matter of fact, the scientific investigation of leprosy will be continued by the Board. Dr. Arning, as you gentlemen will read, was requested by His Excellency to supplement his report with further information—a most reasonable request and one which it might readily be anticipated a willing student or investigator, receiving the financial



HENRY P. BALDWIN.

Of Hawaiian Missionary stock, born 1842, died 1911. Founder of the Baldwin Home at Kalawao, Molokai. One of the foremost captains in the sugar industry, multi-millionaire, resident of the island of Maui. Good, generous friend to the Hawaiian people. Able and sagacious in finance and politics.

and moral support of the government, would accede to. The terms of the declination appear. Upon His Excellency receiving Dr. Arning's assurance that it was not his intention to contribute the information required, and that practically, the information was intentionally withheld, from motives other than those of humanity and science, and the enabling the Hawaiian government to intelligently consider the value to the country of Dr. Arning's elaborate experiments and labors, it was deemed proper to cancel an apparently unlimitable engagement—at any rate, until the meeting of the Legislature.

His Excellency's desire has been to lay the foundation in this city of a repository of medical knowledge for the use of all medical men and others interested in leprosy, and to collect there for reference, specimens, photographs, notes of cases and experiments, books of reference, and so forth, such as would be of infinite value to medical observers and practitioners. As a preliminary to this His Excellency has obtained from foreign governments the information referred to in the correspondence with Dr. Arning, and it was not unreasonable to expect that a distinguished scientific student, "commissioned by one of the highest scientific bodies," from no motives of gain, but prompted by the simple enthusiasm of science and philanthropy, would cheerfully avail himself of an opportunity to aid his fellow men in so philanthropical a cause.

His Excellency desires me to express his cordial commendation of the humane and patriotic spirit which has induced you, gentlemen, and others, to provide for Dr. Arning's salary for two years in order to enable him to continue his investigations, and I am instructed to say that His Excellency will be glad to provide all such facilities and moral support as may be accorded within the law, by the Board of Health, to promote scientific or other investigations or experiments, by any foreign physicians coming here accredited by a scientific body, or by their respective governments.

As Dr. Arning has already had over two years' experience in the investigation of leprosy in this country, His Excellency will be glad to afford him further opportunities to study the disease, under what he deems most favorable conditions, with all the surroundings that could be desired by a humane and earnest scientific investigator—by enabling him to pursue his investigations at the Leper Settlement on Molokai. At that place there are upwards of 600 lepers of all ages, sex, and condition, and in varying stages of the disease; and, furthermore, Dr. Arning will find there several of

his former patients whom, he says in his report, were removed from his charge and treatment.

His Excellency will recommend to the Board that Dr. Arning be provided with a house at the Settlement for a private residence, with out-buildings for small hospitals and laboratory, and such patients as he may desire to have placed under his special charge under conditions not in conflict with the general medical management of the physician of the Settlement. His Excellency will also recommend that Dr. Arning be provided with rations, or an allowance in lieu thereof; with one or two riding horses, and with one or more animals, such as sheep, hogs, etc., that can be found at the Settlement, and may be required for inoculation or other experiments. He will be permitted a reasonable liberty of action, and all facilities and moral support within the power of the Board of Health to accord to him.

I have the honor to be, gentlemen,

Your most obedient servant,

FRED H. HAYSELDEN,
Secretary Board of Health.

* * *

Honolulu, February 8, 1886.

*His Excellency W. M. Gibson,
President of the Board of Health.*

Sir: We have the honor to acknowledge the receipt of the letter of the secretary of the Board of Health, in reply to our letter of the 28th ult., to Your Excellency.

Without attempting to reply to all points in the secretary's letter, we will give our attention to that part most pertinent to the object we are charged with—that is, the paragraph which reads as follows: "As Dr. Arning has already had over two years' experience in the investigation of leprosy in this country, His Excellency will be glad to afford him further opportunities to study the diseases under what he deems most favorable conditions, with all the surroundings that could be desired by a humane and earnest scientific investigator, by enabling him to pursue his investigations at the Leper Settlement on Molokai. At that place there are upwards of 600 lepers of all ages, sex, and condition, and in varying stages of the disease; and furthermore, Dr. Arning will find there

several of his former patients whom he says in his report were removed from his charge and treatment."

As Dr. Arning has heretofore been permitted to pursue his investigations at Kakaako (the branch hospital for lepers), as well as at the Leper Settlement on Molokai, and as those acquainted with the two localities, know the former affords many conveniences and advantages (to say nothing about the greater personal risk and privation at the Settlement), which could not be provided at the latter without large additional expense to the physician, as well as to the treasury, and in some important particulars could not be provided at all, we cannot regard the letter of the secretary, as it now reads, otherwise than as withholding suitable facilities for further investigation by Dr. Arning. You, no doubt, anticipate his declining to be confined to the Molokai Settlement, and he will have no reason to fear that his reputation as a "humane and earnest scientific investigator," will be compromised by so doing. There is no doubt as to the liberal disposition of the Legislature of this country in the past, or for the future in all matters relating to the public health, and that body is not likely to regard the sum already expended, or that will be required in the future for Dr. Arning's services if he is permitted to continue them, as excessive or mis-spent.

Dr. Arning is, we believe, the first scientific investigator who has come from abroad, to devote himself to the study of leprosy, since the government began to care for the lepers, and if he is compelled to stop in the midst of his work for lack of support and facilities within the control of the Board of Health, it is unlikely that any other foreign physician "accredited by a scientific body, or by his government," will offer his services for a like purpose.

Without further preliminary, we now beg to state what Dr. Arning considers requisite in order to pursue his investigations in a manner most likely to lead to valuable results, which is substantially as follows: Free access to the branch hospital at Kakaako, and to the Leper Settlement on Molokai, for himself and his assistant, and to all of the inmates at both places; a separate hospital ward of eight beds at Kakaako, for four male and four female cases to be selected by himself; the ward to be fitted and appointed as stated in his late report to the Board of Health; a room attached to the ward with a northerly light, and with water, etc., for special work; a convenient place for such animals as are necessary for experiments; and also the firm and hearty support of the Board, in certain work which may not be agreeable to the mind of the patients,

but which forms a most essential part of the investigation, i. e., regulation of diet, post-mortems, etc.; and finally, it should be understood that no patient will be removed from his care without his knowledge and without reason given therefor.

If, in the foregoing, anything is asked for which cannot be granted, we shall feel much obliged if Your Excellency will state what item it is, so that we may see whether or not it can be omitted or arranged for in any other way; but if the Honorable Board of Health will not grant the facilities within its control, or declines to provide such facilities at Kakaako, then the purpose of those who are willing to assist with their means in promoting this important investigation in the interest of the public, will be defeated, and Dr. Arning will not be detained any longer, a result which we should greatly regret.

We remain, sir, your obedient servants,

CHAS. R. BISHOP,
F. A. SCHAEFER,
J. B. ATHERTON,

Committee.

* * *

Office of the Board of Health,
Honolulu, February 10, 1886.

To Hon. Charles R. Bishop, F. A. Schaefer, Esq., and J. B. Atherton, Esq.

Gentlemen: I have the honor to acknowledge receipt of your letter of the 8th inst., and have to say, in reply, that I am somewhat surprised at its contents, especially at the tone in which the declination of the offer made by me in behalf of the Board of Health to you, on Dr. Arning's behalf, is conveyed.

Apparently it would be useless to reiterate or enlarge upon the advantages, which I believe the Leper Settlement on Molokai (the chief center of the disease, where there are over 600 cases of confirmed leprosy), possesses over the branch hospital at Kakaako (with barely one hundred cases of a much milder type), for such a line of investigation as is proposed by you for Dr. Arning.

It suggests itself in this connection, to my mind, that the assistance and co-operation of such an able and experienced physician, as the resident physician at the Settlement, should be worthy of some consideration, as it might be of practical benefit to Dr.

Arning, who certainly could endure, equally with Dr. Mouritz, in the cause of science, "the greater personal risk and privation at the Settlement."

The uncalled for assumption conveyed by the expression, "you no doubt anticipate his declining to be confined to the Molokai Settlement," compels me to believe that Dr. Arning has met with unwise advisers, whose course of action throughout has been dictated, not entirely for the public welfare, nor by philanthropic interest in the progress of Dr. Arning's labors on behalf of the lepers; and I regret that, even in the cause of the sick, unworthy prejudices are permitted to intrude where charity, as well as science, should be supreme.

The ultimatum, it can scarcely be called a request, of "what Dr. Arning considers requisite," I deem it necessary to say, must be emphatically declined. In my opinion the proposal is one of such an important character in its present bearings, and future connections with established departments of the government, that it should be reserved for legislative discussion and action, in connection with other kindred plans and proposals relative to leprosy.

To grant the demands of those who claim to speak on behalf of Dr. Arning, would be practically to create an irresponsible extra-medical department for leprosy, capable, perhaps, in the hands of Dr. Arning, individually, of doing much good; but, at the same time, possessing the elements of discord, and the possibility of creating considerable confusion and mischief. Furthermore, it would be establishing a precedent for creating indirectly a new and largely salaried office, the responsibility of which I do not feel inclined to advise the Board of Health to accept.

I beg to say, gentlemen, that I do not impute to you such a motive, in your anxiety on Dr. Arning's behalf, but I feel it proper to intimate that such a result would be a possible sequence to your efforts—if successful.

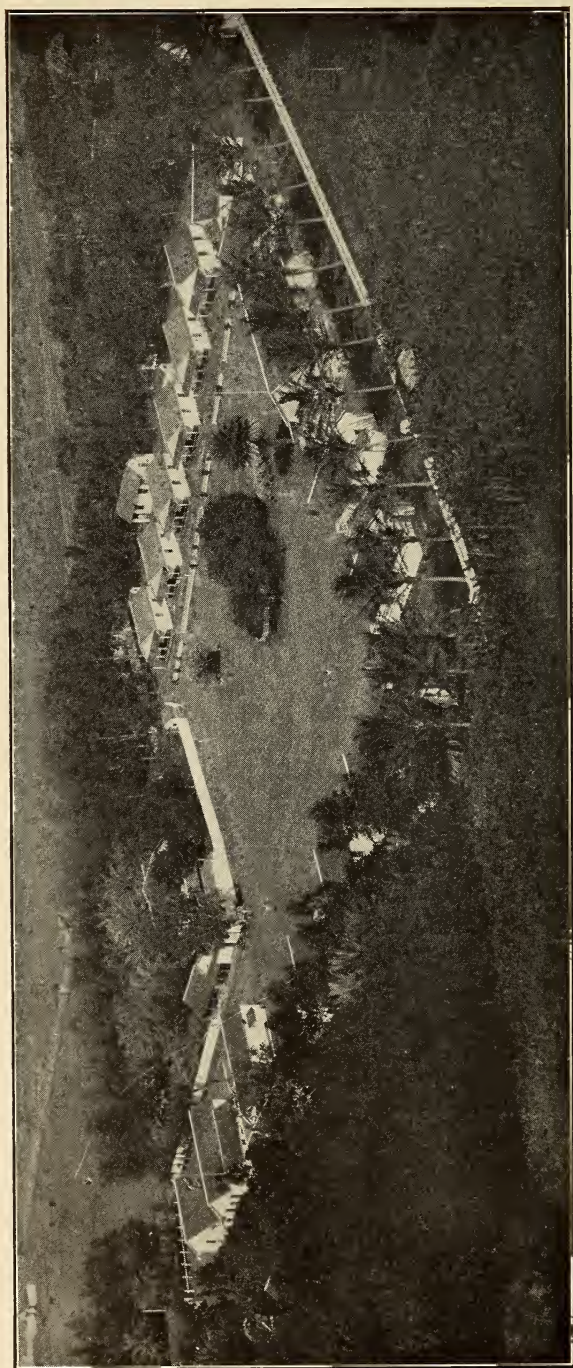
I regret that the offer made to Dr. Arning, on behalf of the Board of Health, in the letter of the secretary of the Board, of the 30th ult., has been declined.

I have the honor to be, gentlemen,

Your most obedient servant,

WALTER M. GIBSON,

President Board of Health.



KALAWAO.
The Baldwin Home,

SPECIAL REPORT OF ARTHUR MOURITZ, M. D.

Physician to the Leper Settlement and Island of Molokai.

*To His Excellency W. M. Gibson,
President of the Board of Health.*

Sir: I have the honor to submit my report on the Leper Settlement, and at the same time treating in detail the suggestions contained in the letter of the secretary of the Board, dated December 21, 1885.

Whilst submitting the statements contained in my report, I think it almost superfluous to draw Your Excellency's attention to the difficulty attached to the prosecution of inquiries on the subject of leprosy in this kingdom, as knowledge of a clear and concise nature, from the very obtruseness of the subject, can scarcely be gained.

The materials for drawing up true and reliable information do not exist in this country, or if they do exist at all, it is only within a very recent period; books, papers or any printed or written records are for the most part wanting. Vivâ voce interrogation of old residents (foreigners) give rise to such diversities of opinion, that only doubt and increased perplexity ensue in the mind of the interrogator; such means of seeking the truth, however, must be put aside. Again, on the other hand, an obstacle of no small moment arises in the *total unreliability of the information received from the natives themselves*, from want of a thorough comprehension and appreciation of the great importance and aim required in answering questions pertaining to scientific enquiry. To sum up briefly, no satisfactory information, bearing on the subject of leprosy in all its phases, can as yet be given.

I wish at the outset to state that my personal views, and the information set forth generally, will, as far as possible, deal with the subject of leprosy as met with in the Hawaiian Islands; also, that my statements and deductions apply to my own personal field of observation chiefly, viz., the Leper Settlement on Molokai.

As to the origin of leprosy in these islands.—On this point I must confess I have not found any information sufficiently reliable to be put on record as authentic.

When I first entered this country, a few years ago, I asked about the origin of leprosy, interrogating physicians and many

laymen on their own views of the matter, or if they had met with hearsay evidence. No two replies were alike, but most agreed that leprosy did not prevail extensively in these islands before the year 1860, some twenty-six years ago. If cases of the disease did exist previous to this date, they did not obtrude themselves on public view to a sufficient extent so as to be noticeable, or to call for any general comment.

According to the information set forth by Dr. Hillebrand, leprosy was introduced into Honolulu by the Chinese in the year 1848, and the doctor saw the first Hawaiian leper five years later; ten years afterwards the disease had spread considerably in the immediate neighborhood of presumably the first propagated Hawaiian case.

These facts, as related by Dr. Hillebrand, are very valuable, and in so far as Honolulu is concerned, may be quite sufficient to account for the appearance and spread of leprosy there. But to conclude that from this focus the disease spread over the entire group, such a conclusion is open to many objections. Undoubtedly there must have been other forces at work to cause the disease to increase to its present proportions on all the larger islands. It is, however, quite possible that the Chinese carried leprosy primarily to other places on the group besides Honolulu.

The Segregation of the Lepers.—About the year 1864 the large increase in the number of lepers commenced to agitate the mind of the community, and steps were taken to adopt measures to check the spread of the disease, and the law of segregation was enacted in January, 1865.

In November of that year a small hospital was established near Honolulu, at Kalihi, capable of accommodating about fifty inmates, where a somewhat systematic inspection could be made of those who were brought to the hospital as lepers, many persons being arrested in error, the disease not being leprosy. These, of course, were liberated; the mild cases, and those of moderate degrees of severity to whom some good might be expected to accrue from improved conditions of living and medical treatment, were kept in the hospital; the confirmed and hopeless cases were sent to the permanent settlement, the site of which had been selected at Kalawao, on the island of Molokai.

Dr. Hoffman, of Honolulu, who was connected with the Kalihi hospital at its establishment, has kindly given me the following information: "Generally fifty cases were under treatment from time to time in the hospital, the cases being equally divided.

The two usually described varieties of the disease existed, viz., the tubercular and the anaesthetic; the former, as is usual, predominated. During my charge between 600 and 700 lepers were transferred to Kalawao. I found no permanent benefit from treatment; better food and cleanliness, medicine, suited to improve the general health of the leper ameliorated the disease temporarily."

The hospital at Kalihi was abolished in the year 1875. During its existence about forty lepers died there, and some ten deserted, but all the others who had passed through its portals (the diagnosis of the disease being certain) finally reached Molokai; many, however, being conveyed direct to the Settlement from the other islands.

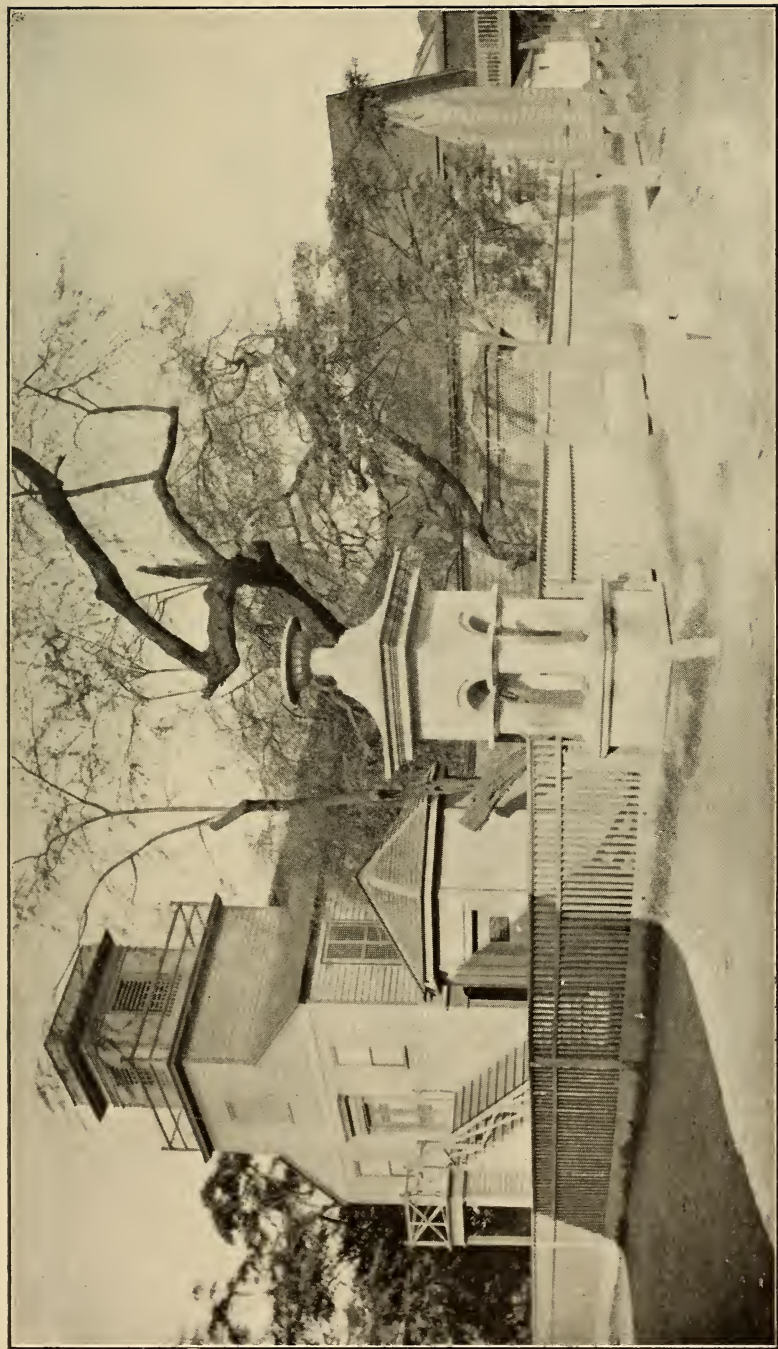
The Leper Settlement.—The Leper Settlement on Molokai is situated about the center of the north or windward coast of the island, and in so far as the question of isolation from the adjacent portion of the land is concerned, a better site could not have been chosen. Nature herself having disconnected the upland from the plain below; the intervention of a steep and lofty mountain chain completely encompassing the plain on the landward side. The plain is in the form of a tongue of land, two sides being washed by the ocean, the third or the base of the tongue ending in perpendicular cliffs, washed by the sea, affording no egress or ingress, except by boat or canoe. The extreme length of this tongue of land, which runs almost due north and south, is about two and three-quarters miles, at the base where the said portion of land joins the mountains its width is three miles, at the center of the tongue two and one-half miles wide, and seaward toward the apex, one mile wide, comprising approximately four square miles of surface, richly covered was grass, but totally devoid of trees. On the eastern side close to the base of the mountain lies the village of Kalawao. At a similar situation on the western shore, but further removed from the mountains, lies the village of Kalaupapa, the chief port of the Settlement, where merchandise, food, etc., are generally landed. Three-quarters of a mile seaward of Kalaupapa lies the small village of Iliopi. Makanalua is placed close in to the mountains, midway between Kalaupapa and Kalawao; immediately opposite and to the seaward of this village rise the walls of the extinct crater of Kauhako, which attains an elevation of 493 feet above sea level. This crater, when active, in conjunction with the soil washed from the adjacent gorges and sides of the mountains, has formed the lands which comprise the Leper Settlement.

From the eastward edge of Kauhako the land trends towards the sea, and ends in rugged, steep cliffs one hundred feet high, making access to the seashore a difficult and almost impossible undertaking. The north shore resembles the eastern, but the cliffs are less elevated—about fifteen to twenty feet and honeycombed by the force of the ocean. The northwest shore is level with the sea, and affords easy access to it, which, as the western shore is continued landward, becomes more difficult, even off Kalaupapa—the port. There is a considerable break in the rim of the crater of Kauhako towards the northeast, where the lava has burst out; the elevated edges of this channel trend from northeast to north, forming a barrier which breaks the force of the northeast trade wind, and thereby affords some shelter to Kalaupapa. The village of Kalawao, as I have mentioned before, is situated on the eastern side of the Leper Reservation, and is exposed to the full force of the northeast trade wind—the usually prevailing wind—which assumes the proportion of a gale for days and weeks together, and it is chiefly on this account that the land is devoid of trees, together with the wind being strongly impregnated with saline matter.

During many days in the winter months the climate of Kalawao is most ungenial, being bleak, cold, and rainy; these conditions being of comparatively no inconvenience to the healthy, but to the leper a serious drawback. Then, again, the high cliffs towering 3,000 feet above the village, effectually shut out the direct rays of the sun from the early hours of the afternoon.

Kalaupapa faces the west, is sheltered by Kauhako from the prevailing wind, is further removed from the base of the mountains, and, therefore, has the direct benefit accruing from the sun's rays. The abundance of the grass affords evidences of a considerable rainfall, and this is the experience of the residents. In 205 days, dating from early in November, 1884, to the end of May, 1885, (the rainy season here occurring in the months of November, December, January, and February), rain fell on 101 days, sometimes continuously for days together; notably the end of April and beginning of May. I was informed, however, that 1885 was an unusually wet year.

The slope of the surface and the geological formation (lava rock covered with a foot or two of soil) conduce towards good drainage, so that the heavy rainfall does not affect the health of the residents as it would do provided the surface water had opportunity of storage, which would then occasion subsoil dampness, with



THE BETHEL CHURCH.

The Rev. S. C. Damon, D. D., the father of the late Francis W. Damon, was chaplain of the "Bethel" for thirty years. He died February 7, 1885, aged seventy years. He founded "The Friend," a quasi-religious monthly periodical, in the year 1842. On the afternoon of April 18, 1886, "the historic Bethel" was destroyed by a sweeping fire, originating in Chinatown, on Hotel street near Nuuanu. This disaster was a sad blow to the Damon family and others; in one short hour all the cherished associations connected with this church were swept away.

its concomitant evils, excess of rheumatism, catarrhal complaints, and phthisis, etc.

The mountain range, which shuts off the Leper Settlement, is continued east and west the whole length of the island of Molokai, gradually reaching a less elevation towards the westward, but towards the east rising until finally the mountains acquire an elevation of from 3,000 to 4,000 feet. The seaward side of this range of mountains, as viewed from Kalawao, is bold and rugged, and after a rain storm, when numerous cascades fall from the mountain sides, the grandeur of the scenery is much enhanced; deep gorges, shut in on three sides by towering ramparts of rock, alone accessible by sea, further beautifies the natural scenery.

The appended table shows the average daily temperature in the shade, taken at 12 m. for eleven months:

		Centigrade Scale
1884,	November	23.4
"	December	22.2
1885,	January	20.0
"	February	19.5
"	March	21.5
"	April	20.8
"	May	21.3
"	June .....	.....
"	July	26.0
"	August	26.0
"	September	25.3
"	October	24.3

The water supply of Kalawao is obtained by partially damming a mountain stream, and from this storage it is conducted in pipes and distributed at intervals through the village. The quantity of water is mainly dependent, if not altogether, on the rainfall, which I have stated already is abundant, drought being a rare occurrence; but the storage capacity of the reservoir is too limited.

Kalaupapa has several springs situated on the beach; the quantity of water they supply is sufficient for domestic wants, but it is not overabundant. Its quality is not good, being largely impregnated with chlorides, and if other sources of potable supply could be conveniently obtained, it would be highly desirable to dispense with its use for drinking purposes.

The dwellings provided for the lepers by the Board of Health are built of wood, whitewashed in and out, and are fairly com-

fortable, being a great advance on the accommodation provided in the early years of segregation.

The average accommodation provided for each leper is a cubic space of about 500 feet; at the present time, as the Settlement is not very full, each leper has nearly 1,000 feet of cubic space in his or her dwelling. Wooden houses not being air-tight, 1,000 feet of cubic space is ample for mild cases of leprosy; but all bad cases should be accommodated on the basis of infectious diseases, and provided with not less than 2,000 feet of cubic space, with 144 square feet of floor for each individual case.

The question of ventilation also requires careful consideration. The system at Kalawao has apparently never had attention given to it, and the result is that either the leper is chilled to the marrow or he is poisoned by his own exhalations. Many of the lepers are encouraged by the Board to build better houses for themselves, and some are erected quite pretentiously, neat and clean in and out, approaching quite a degree of comfort.

The dwellings of the lepers are kept fairly clean by the inmates; surrounded by a stone wall, enclosing half an acre or so, also adds to the better appearance of the cottages. Within this enclosure sweet potatoes, bananas, sugar cane, and onions are generally cultivated, the edibles thus obtained adding materially to the ration of food allowed by the Board.

The interior of the Hawaiian house, generally, is devoid of furniture, the floor-mat or mats forming bed, bedstead and chairs; a few calabashes for food complete the equipment of Hawaiian domestic life. So it is carried on at the Settlement.

At Kalawao is situated the hospital or home, where the worst cases are supposed to be accommodated. The site of this establishment is on the hill-side, about half a mile from the sea, and comprises an area of less than two acres, surrounded by a picket fence. Five wooden buildings, about 40 x 15, and six smaller erections, comprise the accommodation, the usual offices for preparing and storing food being in close proximity. Food, washing, and lodging are provided for the inmates, medical treatment if desired, and some attempt at nursing; but its main claim on the Hawaiian, appears to me, that he is saved the trouble of preparing his food, washing his clothes, and procuring fuel.

Of course there are no cases of cure, and those who enter its portals remain till death releases them. Generally the Hawaiian is prejudiced against hospital restraint and treatment, not only here, but all over the islands. Many of the worst cases pre-

fer to remain outside; the very cases the hospital was intended for, do not avail themselves of the benefits we, as foreigners, think belong to such institutions. Whenever I have suggested to any sufferer outside, whom I thought would be benefited by a residence in the hospital, and the desirability of having him removed there, with scarcely an exception the answer has been, "I prefer to remain and die where I am." From these remarks, it is scarcely necessary to add that I have not thought it advisable to suggest to the Board that a post-mortem room, operating theatre, etc., and other such requisites for ordinary every-day hospital routine, should be added to the present buildings. For, had I any of these facilities, I could make but little use of them, as prejudice against innovations, and foreign medical ideas prevails largely.

With a few remarks on segregation, I will conclude this section of my report.

Very few lepers surrender themselves voluntarily—to do so is not the rule, but the exception; on the other hand, resistance is rarely offered to the execution of the law, the Hawaiians being a peaceful people; in this alone, when the execution of sanitary law is enforced, showing a lustrous example to many ancient nations, presumably more enlightened, who even now assail the execution of the simplest needful sanitary measures, the detention of the individual not being in the question. That lepers are frequently secreted by their friends is true, and quite natural that such should be the case, as no dread of the disease is manifested amongst the Hawaiians. The healthy live in the same house, eat out of the same utensils, sleep together in the same bed as the leper; all these conditions of life bringing them closely in contact with the disease, and by this means leprosy is, in my opinion, only too certainly and too frequently spread.

The law of segregation is actively enforced as follows: On notice or complaint being given to the sheriff of the district in which a leper resides, he (the sheriff) notifies the sufferer to appear before a physician (always a foreigner), or brings the leper to some public office (say courthouse), then notifies the nearest foreign physician to attend and examine the case, whether of leprosy or not. If the diagnosis is certain, then by the easiest method and most convenient route or conveyance, the leper is removed from his home, either direct to Molokai, but more generally to the receiving-house at Kakaako, for further medical examination before being segregated finally.

That all lepers should be segregated I quite agree; that all

lepers could be segregated is quite a different matter, and almost impossible, in fact. Severe cases generally become public nuisances, and are dealt with first; though even if left at large, they have the advantage of acting as danger signals to the foreigner, and to the populace generally, in nearly all countries but Hawaii. The inhabitants of the islands (the indigenous ones I mean) have always shown an utter disregard and ignorant contempt for leprosy, which slowly, but silently, seizes its victims; in fact, according to our foreign ideas of the manner disease is spread, the Hawaiian makes every effort to saturate his system with the germ of leprosy—that many only too well succeed, and thereby pay the penalty with their lives, will be shortly indicated in my tables, showing the arrivals and mortality at the Leper Settlement. In my opinion, the great defect of the law of segregation of lepers lies in the fact that it carries no moral weight, and fails to get at the root of the evil; and until such time as the Hawaiian mind is impressed with the necessity of social ostracism being practiced towards all lepers, not till then will the true advantages of public segregation in chosen sites be made manifest. Did social ostracism exist at the present day amongst the Hawaiians, as regards the leper, probably the non-contagious view of the disease might receive considerable support.

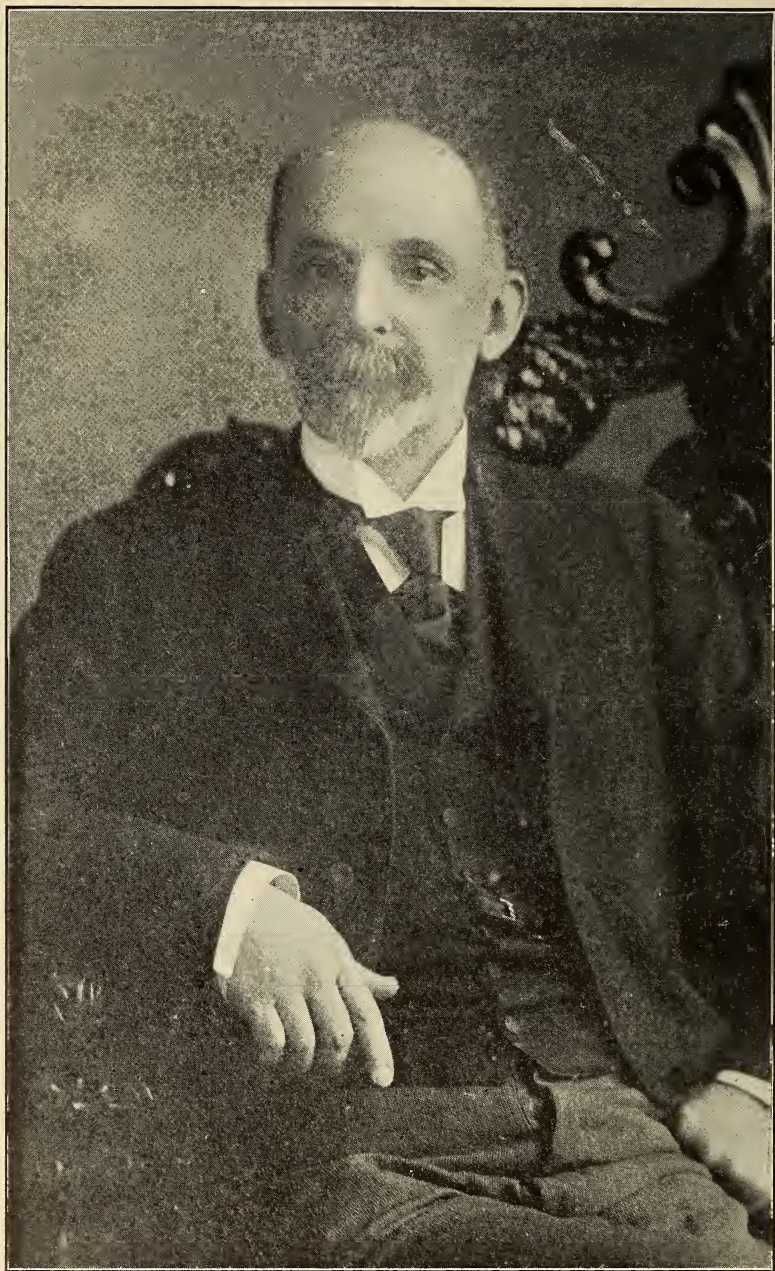
Lastly, whether segregation as carried out for the past twenty years, has had any beneficial effect on staying the progress of leprosy I cannot offer an opinion, my residence in the country being too brief.

In my statistics I have eliminated all kokuas, male and female (non-lepers), who had been placed on the list as lepers, but drawing rations; these people entered into the lists of arrivals and deaths.

The rule of the Settlement, placing all children born in it on the leper ration list, swells the death list and the arrivals. When their death took place under twelve months, I have invariably struck them out of my mortality figures, as it was most probable that they had not then become lepers. It happens, therefore, that there are a greater number of names on the list of lepers than I take account of, for the reasons above stated.

In twenty years (1866-1886), the male Hawaiian lepers show an excess of 809 over the females; or, briefly, the male lepers exceed the females in the ratio of 19 to 11.

Again the excess of mixed Hawaiian blood, Caucasian and Asiatic-Hawaiian males, over females of mixed Hawaiian blood is shown as under:



REV. FRANCIS W. DAMON.

Born in Honolulu December 10, 1852. Died at Moanalua June 22, 1915.

A refined, courteous gentleman, an accomplished Chinese scholar, and a guiding Pole-star to the Chinese in Hawaii in all matters tending to their elevation. His peculiar fitness for his chosen life work was such, "that no other can fill his place."

The late F. W. Damon was the friend, spiritual adviser and comforter of the Chinese lepers in Kakaako and Kalihi hospitals.

Males	270
Females	90
Excess	180

So that male mixed blood exceeds that of the same female race in the proportion of 3 to 1.

The excess of the male lepers over the female is no exception to the information received, on the same question, from all other countries where leprosy exists. The male lepers invariably exceed the female (I know of no instance to the contrary), due regard being paid to the excess of males over females in the general population.

In regard to the number of lepers segregated annually. In the year 1873, four hundred and eighty-seven lepers were sent to the Settlement. With this large accession the number on the list reached 809, comprised of 498 males, and 311 females.

Again, ten years afterwards, another large reinforcement was received at the Settlement; this was in the year 1883, when 301 lepers were added to the list. On August 19, 1883, the daily recorded list shows a total of 841 souls, these 841 persons being comprised of 512 males and 329 females. The smallest number of lepers received at the Settlement in any one year since its foundation was in 1880, 51 persons being placed on the books as fresh arrivals.

ADDENDA

(In the year 1888, 345 males and 226 females were segregated, total, 571—the largest number in any one year. On January 1, 1890, there were 1,213 lepers on the list—highest number in the history of segregation.)

The numbers under the head “discharged” comprise the following cases:

1. Non-lepers—these comprise the majority.
2. Sent to Honolulu for treatment.
3. Sent to Kapiolani Home.
4. Removed for crime.

The mortality figures need no special analysis into *per cents*, the number of leper residents being so small. The largest number of deaths in any one year occurred in 1879, when the mortality reached the total of 209, or 26 per cent; but then it must be taken into account that there were a larger number of lepers on the list

January 1, 1879 (viz., 802), than in any other year at a similar date.

The average mortality per annum for the first decade amounts to 22 per cent, approximately, and the average annual mortality for the second decade is 20 per cent. The greatest number of deaths recorded in any one month was in May, 1880, the total reaching 38.

I have collected and tabulated 1,812 cases of leprosy, the books, unfortunately, not permitting me to analyse the whole number of native lepers received since the foundation of the Settlement (January 6, 1866); these amount to 2,997 persons.

The headings of the following table show the analyses of these 1,812 cases, chiefly in the matter of the insular distribution. Three of the main islands (Kauai, Oahu and Hawaii), as regards the number of lepers to the whole population of each island respectively, give almost the same result.

Maui shows an excess of lepers to its population, viz., 1 to 17, in comparison with the three other large islands. This island (Maui) also stands out prominently with "district excess" of lepers, calculated per one hundred inhabitants.

There are also several local districts included in the main districts in which the number of cases of leprosy segregated from these said smaller local districts appears excessive; whether so relatively to the population I have no means of accurately determining, the census returns simply giving the population in bulk.

Such excess for local districts are given in this table, the number of lepers being equal in several:

	Local District	Number of Lepers
Kauai	Hanapepe	18
Oahu	Kaneohe	18
Oahu	Heeia	15
Maui	Kaupo	15
Maui	Waikapu	18
Maui	Waihee	34
Hawaii	Waipio	37

GEOGRAPHICAL DISTRIBUTION AND PREVALENCE

The following tabulated statement shows an analysis of 1,812 cases of leprosy, taken from the records at Kalawao (calculations

approximate, fractions omitted, and native population only dealt with), showing number of lepers in each district in proportion to the population:

Island	District	No. of Lepers	Proportion of Lepers to 100 Population	Ratio of Lepers to Whole Population of Each Island
Kauai	Koolau	48	6	1 to 23
	Halaleia			
Niihau	Puna	34	3	1 to 23
	Kona	80	5	
Oahu	Niihau	408	4	1 to 23
	Honolulu			
	Ewa	30	3	
	Waianae	13		
	Waialua	38	6	
	Koolauloa	31	3	
Maui	Koolaupoko	35	3	1 to 17
	Kona	111	7	
	Wailuku	166	6	
	Makawao	64	3	
	Hamakua	47		
	Hana	67	7	
Hawaii	Kahikinui	20		1 to 24
	Kohala	107	4	
	Hamakua	75	5	
	Hilo	125	5	
	Puna	23	3	
	Kau	38	3	
Molokai	Kona	126	4	1 to 29
	Koolau	89*(1)	22	
Lanai	Kona	34	3	1 to 50
	Lanai	3	2	
		1,812		

* (1) Formerly kokuas, now lepers at Kalawao.

CONTAGION.—The whole history of leprosy in the Hawaiian Islands from its introduction to its present rapid spread and development, verily proves that it can only be accounted for by regarding it as a contagious disease, and that it spreads from individual to individual. Whatever else may be said of its being non-contagious in other ancient countries, where the disease exists endemically, these statements do not apply, or should not apply, to the disease in the Hawaiian Islands. Even in other countries where the disease has existed for centuries, the question of contagion or non-contagion is not definitely settled, the evidence tending in many cases to affirm contagion; in many others to negative this conclusion.

How any competent observer concludes that leprosy is non-contagious in these islands is to me only accountable by presuming *that previous views from extraneous sources have clouded his powers of observation.*

That leprosy did not prevail on these islands until many years after they were open to foreign intercourse, receives great confirmation in the fact that no true aboriginal word is in use for the name of the disease. I consider this a most significant illustration of the rapid spread of leprosy within a comparatively short era. I believe it perfectly safe to affirm that did leprosy exist amongst the ancient Hawaiians they would not call it, as the present race do, "Chinese sickness." Whatever defects the Hawaiian language may have, a very casual observation shows that it was in the highest degree, and is a language of minuteness and exactitude; for example, take the verb "to break," in the Hawaiian language it is exquisitely definite—to break, as glass, "naha;" to break, as rope, "moku;" to break, as bone or stick, "haki;" and it can scarcely be imagined that naming a slow progressive disease like leprosy was beyond the power of their intellect, and yet this is really what those who claim to trace a hereditary development of the disease ask us to do. The name "mai pake" may, no doubt, have originated on the interrogation by a native of a Chinaman, "What is this disease?" The Chinaman would probably answer, "I do not know the Hawaiian word, but there are plenty of people sick with the disease in my country." Chinese with leprosy do not generally emigrate, though the disease may appear after their arrival in the islands. As I have before mentioned, Mr. Stewart states the disease prevailed in the year 1823. What significance the absence of a true Hawaiian word for leprosy bears, is such, that this very absence in itself is almost sufficient evidence to prove that leprosy has not reached its present development by hereditary influence only, and that a very strong, helping hand has



CHINESE MOTHER AND BABE.

Type of people who miss and lament the late Francis W. Damon; he spoke their language, and was their monitor and friend in need.

been offered by contagion, the period being too short for the influence of heredity to show itself, if it is hereditary at all.

I repeat, on no other grounds can the spread of leprosy be explained in the Hawaiian Islands, than by regarding the disease as contagious. Were the habits of the people different to what they are, one might have some diffidence in arriving at this conclusion; here we have the best field of observation. In the carelessness of the natives, in disease generally, their hospitality to the leper, and contempt of the disease, there is also present here in these islands a typical illustration of the ominous remark of Dr. Tilbury Fox—such remark generally being accepted as correct—"that it is in those places where leprosy is on the increase that the freest intermingling of the leprous and non-leprous parts of the community takes place." Could the opposite conclusion be arrived at, "that although in Hawaii free intercourse exists between the leprous and non-leprous," the disease does not spread? I say no. Any calm impartial observer must arrive, sooner or later, at the conclusion that the type of leprosy prevalent in these islands is contagious, whatever else may be related of it in other countries. Many cases, undoubtedly, present some striking peculiarities, giving some credence to the view that the disease is non-contagious; but on a more minute scrutiny such cases can be explained on the principles of analogy, in certain respects like and similar, in other respects different and dissimilar, and did such instances arise in the prevalence of a disease we have more accurate knowledge of, they would present but slight difficulties, these being one of the many peculiar traits of a specific disease like leprosy.

I now wish to state, because I conclude leprosy is contagious, I think I am carrying conviction to the mind of any person, who may happen to read this report; my object is to state facts, and hence the truth must result. Did I wish to write a paper on the non-contagious nature of leprosy, I could do so at the expense of concealing prominent facts bearing on the view that it is contagious; on the other hand, did I wish to prove leprosy contagious, I might conceal many facts proving it non-contagious. To avoid any prospect of being charged with wholly treating leprosy in its contagious aspect, whatever cases bear on the non-contagious view, I will give as great prominence to, and assign to them their relative degree of importance.

I now state my reasons for believing that leprosy is contagious.

1. Heredity, as the sole agent in the propagation of the disease, will not account for its rapid increase in these islands for the following reasons:

(a) Sterility amongst the leprous is much more frequent than fertility. (Years 1884-87.)

(b) The majority of the offspring of leper parents, or parent, are still-born, or die within a short period after birth. The children born at the Settlement, during the past fifteen months, amount to five, and two out of these alone are now alive. And again, it is doubtful if these two remaining infants will reach adolescence, and even then if they do, there is only a bare possibility of their developing leprosy.

(c) Even allowing lepers to be fertile, is not the Hawaiian race notoriously unprolific? and shall I ask the question, whether a healthy parent is more likely to be fertile than the leper? If fertility in a marked degree does not exist amongst the healthy, then it is hardly reasonable to conclude that it will exist to a greater degree amongst the leprous.

Numerous children, the offspring of known lepers, have not developed the disease in their lives, although most probably alleged hereditary predisposition was present, but they never developed leprosy.

That the influence of heredity might play an important role as the sole factor in the propagation of the disease, did the lepers in these islands only aggregate a few hundred since the disease was first definitely known, I quite admit; but when the number of lepers reaches into thousands, I certainly think that another source for its spread must be sought than in the influence of heredity.

2. That, almost invariably, when no (?) hereditary history of the disease is obtainable, I can always elicit the facts "that contact with a leper for long or short periods had existed." I do not think the importance of this evidence can be sufficiently overrated, and it tends to definitely prove leprosy spreads by direct contact from individual to individual.

3. The evidence obtained from foreigners—victims of the disease—and from the history of their own cases, lends strong support to the view that the disease is contagious. It is not rational, but absurd, to conclude that the foreigners who now have the disease, and those who have had the disease (now deceased) acquired it in their respective countries. How does the hereditary theory affect them?

4. The history of Father Damien, who came here (Leper Settlement) in the year 1873, to exercise his calling as Catholic priest, and who has, within the past two years, been afflicted with symptoms suspiciously resembling those of leprosy—(since August, 1885, out-

ward manifestations of tubercular leprosy have appeared, placing the diagnosis beyond all doubt). His case will be discussed further on when dealing with the manner the "contagium" of leprosy enters the system. I may add, also, that Father Damien has always maintained that the disease was contagious; his continuous residence of thirteen years has afforded him plenty of facilities for giving this opinion on the matter.

5. My own observations, from a physician's standpoint, will be stated hereafter.

6. The opinions of experienced and reliable physicians in these islands.

7. The failure to explain its appearance amongst clean families (foreign), known to have no tendency to the disease, otherwise than by regarding the disease in a contagious light.

8. The contagious character of leprosy can be borne out in every particular by the attitude the Hawaiians adopt towards lepers. To state briefly, "The lepers are welcomed in their midst with open arms." Were these conditions reversed, the state of affairs, socially fulfilling rigid seclusion and ostracism, then leprosy spreading to any extent, it would be necessary to seek other sources of spread than contagion supplies.

Under these latter conditions, I do not deny that leprosy would exist, and there would also be strong evidence in favor of the disease being non-contagious. It is from this evidence also that we receive alleged facts applying to those countries where we have reports of the disease being non-contagious.

I now wish to offer a few remarks to illustrate the progress of disease at Kalawao and Kalaupapa amongst the kokuas, both male and female; these are cases that have been under my own observation, and have developed leprosy since my residence at the Settlement.

In the month of January, 1885, I made a thorough medical inspection of all the kokuas residing at the Settlement; the result was as follows:

Total number male kokuas	91
Total number female kokuas	87
Total.....	178

The male kokuas had mostly accompanied their wives, and the female their husbands. There were one or two cases where the father accompanied his son, and a mother her son or daughter, or aunt, nephew and niece. Be the relation what it may, all these healthy people were in contact with lepers continuously.

In the month of August, 1885, I made another inspection.

At the date of my writing this report (January 1, 1886), some twelve months after my first systematic inspection of the kokuas, the state of affairs is as follows:

Number of male kokuas who have become lepers in the twelve months, February, 1885, to February, 1886, 5. Female kokuas who have become lepers during the same period, 12—male 5, female 12; total 17. Total number male and female kokuas, therefore, are 17. Excess of female over male, 7. So that out of a total of 178 healthy people, in twelve months 9.5 per cent have developed leprosy. Then, at the same rate of progress, in twenty years all these people will be lepers. But this is not borne out absolutely, for many Hawaiians live here year after year, marry lepers again and again, and show no manifestations of the disease. Whatever may be said to the contrary, I assert that a *large majority* of the Hawaiian race are positively exempt from the disease under the greatest degree of exposure to infection—they are *non-receptive or immune*.

NON-CONTAGION.—From what I have just written it is evident, I hold the opinion that leprosy is not contagious to everybody. This is the case, and there is nothing remarkable in the statement. Did everybody who comes in contact with our well-known contagious and infectious diseases—small-pox, scarlet fever, measles, typhus, etc.—get each of them respectively, it would be a very dismal prospect for nurses and physicians, and other attendants. I simply assert that many persons have an immunity conferred on them. What confers this special immunity is now foreign to my purpose to enter upon, but the cases which go to prove leprosy non-contagious fall within this special sphere of immunity or non-receptivity.

When I see daily and hourly before my eyes a man who tells me he is perfectly well, looks well, and I conclude he is, after a medical inspection, and after these preliminaries I come to inquire into his history, and he states as follows: "I have had one, two, frequently three, and sometimes four leper wives, and my children have died from leprosy, and I have lived here ten years in contact with all the lepers"—after such a story as this it would be quite reasonable to conclude that leprosy is certainly not contagious to everybody—it is not a question of degree of contagion, but non-contagion and immunity.

Again, when a woman repeats in substance such a story as the following, and after all this contact and exposure, is to outward appearance healthy, one would be justified in concluding that the disease was non-contagious, certainly to this individual woman.

To illustrate.—The washer-woman for the hospital at Kalawao

has washed the soiled clothes of the worst cases, certainly many of them so, in the Settlement for the past seventeen years. Any one who has seen advanced cases of tubercular leprosy knows the condition this soiled linen will present; nor is this her only contact with the disease; she has lepers living in her house, and, to crown all, her husbands, two in number, were lepers for years before they died; and yet, in spite of all this contact, this said woman today is hale, hearty and plump, and as fine a specimen of womanhood as any in the islands; her age is now forty-six years. (This woman Kalehua later developed leprosy, in 1888.)

But are these cases the rule? Certainly not.

These cases number, at the Settlement:

Males	26
Females	22
<hr/>	
Total	48

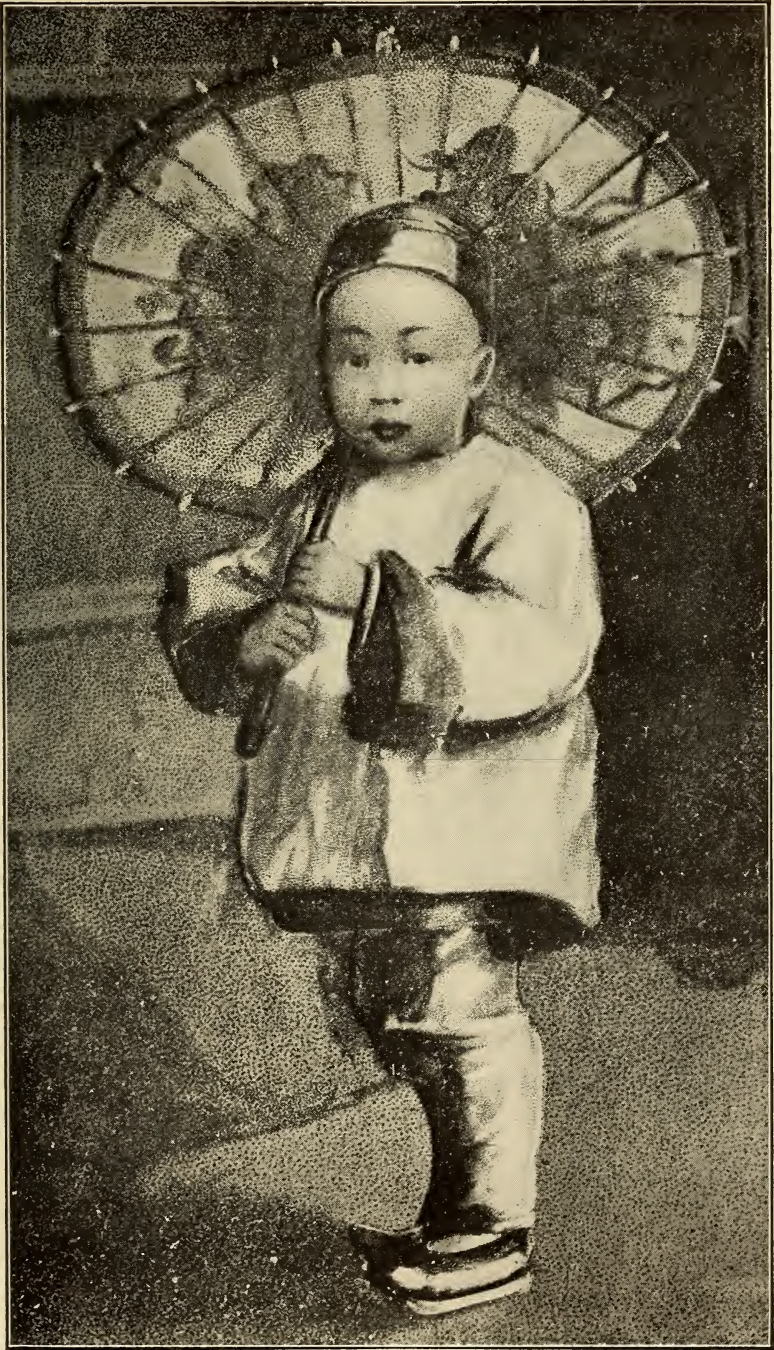
These forty-eight cases give an average of fifteen years each of close and intimate contact. That some will become lepers I am certain; that others will resist all infection I am also positively certain. These are the accumulated Immunists. One woman has lived here nineteen years.

I have already shown the number of kokuas who did develop leprosy last year, viz., seventeen. If the disease develops at the same rate, in three years time the contagious cases will have passed the non-contagious, taking the same figures; and yet these forty-eight are the accumulated veterans of the Settlement.

ALLEGED, HEREDITARY PREDISPOSITION.—As an agent in causing the spread and perpetuation of leprosy, occupies no important position. In these islands, I will place its relative rank next to contagion, giving the latter the position of chief factor at work spreading the disease in this country.

Having before stated, "that, in my opinion, leprosy was introduced here only since the advent of the foreigners," (?) hereditary predisposition has not had opportunity to prove sufficiently the extent of its power; that it can approach its ally, contagion, is not to be thought of, owing to the unprocreativeness of the present Hawaiian race, and how hereditariness in leprosy should or could have been elevated to the first rank of propagator of the disease in these islands I am at a loss to understand. (Read Dr. Fitch's report.)

Predisposition is a name applicable to very few diseases, the least exponent being found in leprosy; syphilis is quite erroneously placed under this heading. Tuberculosis somewhat falls under this heading.



"GENUINE CHINA."

I may here remark that no child born at the Settlement since my period of residence has had manifestations outwardly of leprosy at birth. The causes, so far, that I have mentioned in connection with the spread of leprosy in the Hawaiian Islands are: First, contagion; second, possibly hereditary predisposition. The third cause to which I attach some importance, and which has (?) doubtfully spread the disease, is vaccination.

I can bring forward no case personally, but I have hearsay evidence that after the operation of vaccination had been performed on several white children they manifested signs of leprosy, and finally developed the disease (but the evidence of so acquiring leprosy is far from conclusive). Evidence on this same point is put forward by Sir Ronald Martin, in India, and by Professor H. G. Piffard, of New York. The possibility of such an occurrence again taking place, "now that bovine virus only is used in the operation" by the medical officers of the Hawaiian government, is most improbable.

The extent to which each of the following factors is responsible for spreading leprosy, these factors being contagion, heredity, and vaccination, are approximately as follows:

Contagion,	estimated at 90 per cent.
? Heredity,	estimated at 9 per cent.
? Vaccination,	estimated at 1 per cent.

I have personal knowledge of the two first, which account for almost all cases. Some few cases not coming under either heading, I have placed under vaccination, as being the most feasible situation for them, as in the Hawaiian Islands I recognize no other agents at work, such as we hear of in Norway, India, etc. In these islands no such origin need be sought for, the disease being introduced.

CONTAGIUM.—It is not my intention to enter at length on this subject, except in so far as it trenches on the domain of leprosy.

By the "Contagium of Leprosy," I wish to convey "that supposed specific material in which the infective power ultimately resides."

I believe that the "contagium" of leprosy enters the system by:

1. Inoculation. (?)

- (a) At broken surfaces of the skin.
- (b) At broken surfaces, fissures or chaps, on external mucous surfaces.
- (c) Possibly by puncture of insects, or the presence of parasites, scabies, etc.

(I held these crude ideas in the days of my youth.—Author.)

DIVISION II—INHALATION AND ALIMENTATION.

—An act comparable to inoculation on an external surface takes place on an internal surface.

1. Contagium particles or bacilli conveyed in the sputum and exhalations of the leper (especially in the advanced tubercular cases attended with severe ulceration), enter the mouth, are caught on the tonsils, or are carried into the bronchi and air cells.

2. From eating with soiled fingers, bacilli may be swallowed, reach the stomach and the intestines, and later penetrate the texture of the intestinal mucous membrane, and thus effect as genuine an inoculation, with regard to the blood, as that which art or accident provides in other cases through the punctured skin.

By the first means (inoculation) a few cases of leprosy are (?) propagated, but I do not think it is nearly so frequent as by alimentation. Under this latter heading I would place the case of Father Damien, whose history I briefly relate.

Father Damien arrived at the Settlement in the year 1873, and has lived there continuously ever since. He is a Belgian, of good physique, and when he arrived, was thirty-three years of age. During all the period of his residence he has been daily and hourly in contact with lepers of various grades, many very severe. Until 1884 he felt fairly well. In that year pains in the left foot troubled him; these continued to get worse, and, in the absence of any other signs, were attributed to rheumatism. Towards the end of the year 1884 he consulted Dr. Arning (a physician who is making leprosy a special study), and to this gentleman must be given the credit of diagnosing the disease in its very early stage, as certainly not until six months afterwards did external manifestations of leprosy develop; the symptoms pointing to deposit of leprosy matter in the structures connected with the peroneal nerve in the flexure of the knee. In May, 1885, there were no striking changes in his face, except the forehead, when examined by Dr. Arning and myself. In August, 1885, a small leprosy tubercle manifested itself on the lobe of the right ear, and from that date to the present, diminution and loss of eyebrows, infiltration of the integument over the forehead and cheeks is slowly, but certainly, going on, so that the case of Father Damien is a confirmed tubercular one, the symptoms and signs now present placing it in that class; the Father is careless, has eaten repeatedly with lepers, has a leper cook also.

I believe the majority of cases of leprosy at the Settlement, had they been rigidly watched, would fall in the same category as Father Damien's. Most cases of leprosy are recorded between the ages of twenty-five to forty years, so heredity is scarcely possible.

I am also clearly of opinion that nodular leprosy is contagious at the beginning, and all through its course.

Women are less liable than men to the disease, I believe, owing to (?) physiological causes peculiar to the sex; and, I explain, (the many cases related of certain women having two or three husbands, and although previously clean, falling victims to leprosy, the woman herself remaining unscathed) on these physiological grounds, which, when a certain age is reached and changes occur in the system—resulting in the cessation of menstruation—leprosy, which has been dormant, proceeds to show itself. The female may also possess, however, greater Immunity than the male, this may account for the disparity of prevalence in the sexes.

One other point I wish to allude to, and that is, that I have not met with an intermixing of cases of tubercular and anaesthetic leprosy in the same family. The variety is tubercular alone, or it is anaesthetic alone.

My opinion as to whether I think leprosy and syphilis are homologous is asked, and whether one disease has any connection with the other, or with tuberculosis.

There is no homology between leprosy, tuberculosis and syphilis in my opinion, but there is an analogy. No other constitutional diseases are allied so closely as leprosy, tuberculosis and syphilis; but they are distinct diseases. Leprosy is *sui generis*, tuberculosis and syphilis are each *sui generis*.

I affirm that any observer or physician who has studied syphilis carefully, will speedily see where the diseases agree, and where they do not.

This report is very incomplete. I have written it, much against my own will, in the brief periods I could snatch from the busy hours of my professional work. To cover the vast field of leprosy requires more time and experience than I have had at my disposal.

TREATMENT.—There are legions of alleged cures for leprosy, but most are of no value and cannot be relied on in any given case.

In a few instances, in the early stages of the disease, it is possible to check the progress of leprosy by the persistent use of the following drugs: Calcium sulphide, sodium salicylate, quinine, and guaiacol carbonate.

ARTHUR MOURITZ,

Kalawao, Jan. 1, 1886.

Physician.



"GENUINE CHINA."

NONCONTAGIOUS

REPORT OF DR. G. L. FITCH, 1884.

*To the Honorable the President and Members
of the Board of Health:*

Gentlemen: In this, my quarterly report as medical officer in charge of the Leper Settlement, for the quarter ending September 30th, 1884, I propose to thoroughly discuss the question of the contagious nature of leprosy, and its etiology.

Before expressing any opinion of my own, it will be proper to give the views held by others who have made the study of the disease elsewhere, and so I quote as follows from the "Report on Leprosy by the Royal College of Physicians."

"The Committee having carefully considered the replies already received are of opinion that the weight and value of the evidence they furnish is very greatly in favor of the non-contagiousness of leprosy.

"The Committee can only repeat the statement made in their former report to the College, that the replies already received contained no evidence which, in their opinion, justified any measure for the compulsory segregation of lepers."

Acting on the advices already obtained, the Duke of Newcastle forthwith issued a circular to the governors of the Colonies expressing his opinion "that any laws affecting the personal liberty of lepers ought to be repealed, and that in the meantime, if they shall not be repealed, any action of the executive government in enforcement of them, which is merely authorized, and not subjoined by the law, ought to cease."—Handbook of Treatment, Aitken.

Doctors Danielssen and Boeck state, "that among the hundreds of lepers who we have seen daily, not a single instance has occurred of the disease spreading by contagion. We know many married persons, one of whom is leprous, cohabitating for years without the other becoming affected. At St. George's Hospital many of the attendants of the inmates have lived there for more than thirty years, and are quite free from any trace of the disease. As the result of our observations we have only to deny the contagiousness of leprosy."—Coll. Phys., Report, p. 4, XIX.

Jamaica—

"I am certain that it is in no way contagious, and that it is

not transmissible by sexual intercourse. The evidence against the contagion of leprosy in all its forms is *irrefragable*."—Dr. Fiddes.
Barbadoes—

"I have not met with any cases of contagion; none of those in attendance during the last nine years upon the inmates of the lazaretto have contracted the disease, and I, after receiving a wound from a knife moistened with the fluids of an inmate, have escaped, although the wound was followed by great constitutional irritation and loss of the finger. From what I have heard I do not believe it communicable by sexual intercourse."—Dr. Browne.

Mytilene—

"It is demonstrably not contagious. Dr. Bargilli practiced inoculation in two instances, but without results."—Dr. Brunelli.

Mauritius—

"I know two instances where medical men have wounded themselves in dissection, but without any bad results."—Dr. Powell.

Crete—

"There are 127 persons who have all lived together healthy among lepers for many years."—Dr. Brunelli.

Benaveo—

"All the reporters agree in stating that leprosy is not contagious, nor transmissible by sexual intercourse."—Dr. Dunbar.

Nagpore—

"During the nine years I have held charge of the Nagpore goal, with the daily average of 500 prisoners, all of whom freely intermingled, and some of whom when imprisoned were lepers, I have never known an instance of contagion. As far I could ascertain the disease does not seem transmissible by sexual intercourse."—Dr. Hende.

New Brunswick—Coll Phys. Report, pp. XLIII, XLIV, XLV.

"I am thoroughly convinced that the disease in Tracadie is not contagious, and that it is not transmissible by sexual intercourse. All the cases I have reported prove its noncontagiousness. Leprous husbands have lived many years with their wives, and vice versa, without infecting each other. Children have been born of leprosy mothers, and have been nursed and handled by patients in the Lazaretto in all stages of the disease, without manifesting any symptoms of the disease."—Dr. Bayard.

"It does not seem to be transmissible by sexual intercourse."—Dr. Gordon.

"I have never met with an instance of leprosy being communicated to a healthy person by contagion. On the contrary we have

a female, who, for the last six years has scrubbed the floors of the hospital, washed their clothes, ate, drank and slept with those affected, and who, notwithstanding, exhibits no trace of malady, and at present enjoys good health.

"Leprous husbands have, for many years, slept with their wives and families, and wives with their husbands, without contracting it. Children have been born of leprous mothers in the last stages of the disease and have been nursed by lepers, and have now attained adult ages without manifesting any symptoms of the disease. All of which proves it not to be transmissible by sexual intercourse."—Dr. Nicholson.

"Several lepers have cohabited with their wives for years and no infection was communicated to them. In the case of a leprous man now in the hospital, the wife has continued free, although two of seven children which she has borne to him are afflicted with the disease."—Dr. Benson, *Coll. Phys. Report*, p. 4.

William Aitken, M. D., etc., says in his recently issued "Hand-book of Treatment," p. 238, A.D. 1882:

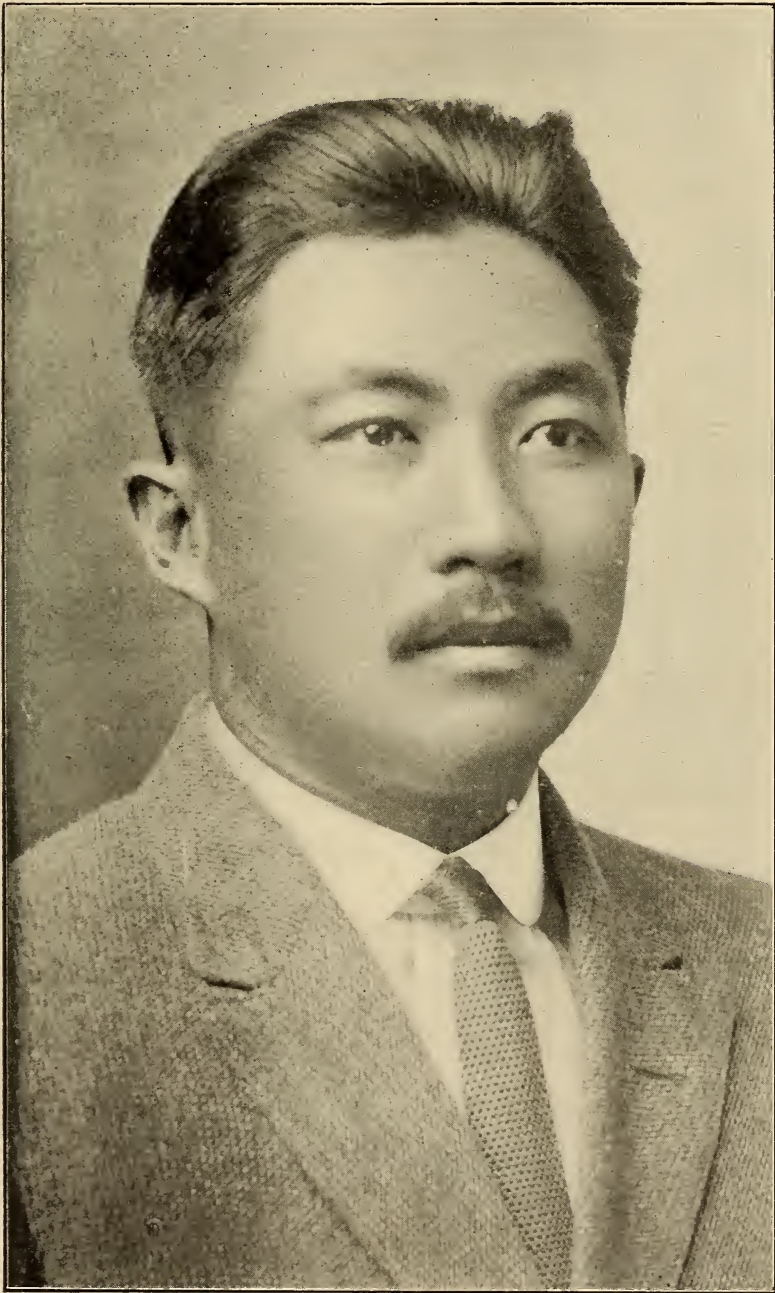
"LEPROSY; TRUE DEFINITION."

"A constitutional noncontagious hereditary affection. There appears no more need (or just about the same) for restricting the liberty of lepers as for restricting the liberty of those afflicted with the gout."

Under the heading:

"A CASE OF INDIGENOUS LEPROSY,"

in the *Medical Record* of August 16th, 1884, W. H. Greddings, M. D., of Aiken, South Carolina, U. S. A., says: "Isolated cases of leprosy have been observed in Charlestown and its vicinity for many years, the present being the latest of a series of twenty that have been brought to my notice during the last twenty-five years. In none of these cases was the disease hereditary, although in one instance a mother and daughter were affected at the same time. In all these cases except the one just mentioned there was not the slightest evidence of contagion, nor has it ever been deemed necessary to isolate those affected with the disease. When well enough they walked about the streets of the city, attracting but little attention, as the people know from experience that in this country they run no risk of contracting the disease by coming in contact with those affected with it.



CHINESE-HAWAIIAN.

"As isolated cases of leprosy have been observed on the coast of South Carolina for nearly forty years, without any apparent increase in the number of cases, it may be safely inferred that there is but little danger that the disease will ever become endemic in this section."

A. Balmanno Squire, M. D., of London, says: "Greek Elephantiasis was formerly thought to be contagious. It has, however, long been satisfactorily ascertained that it is not so."—Reynold's System of Medicine, Vol. 3, p. 948, A.D. 1880.

Thomas Hawkes Tanner, M. D., F.L.S., of London, says: "Elephantiasis Graecorum, or Elephantiasis Anaesthetica, or the Eastern Leprosy, is a terrible and dangerous constitutional disease, being endemic and affecting the poor and badly nourished in preference to the well-fed, while it is noncontagious, hereditary, and generally incurable."—Practice of Medicines, Tanner, p. 671.

"That leprosy in Japan is not in the slightest degree contagious or infectious; that the idea to isolate lepers from other patients does not occur to anybody. In my own wards I have always had lepers between other patients, everybody knowing the nature of the disease, but no one objects to the sleeping in the bed next to theirs. No disinfection is ever used. There is a native doctor in Tokio, in whose family the treatment of leprosy has been carried on as a specialty for at least three generations, he and his whole family live in the same house with his leper patients. For a hundred years, many, many thousands have been treated in that very same house in the center of the capital, inhabited by more than a million of people and never one case of contagion has happened."—Dr. Baelz, Prof. of Chemical Medicine at the University of Tokio, Japan (on board the steamer "City of Tokio, Pacific Ocean, September, 1884.)

Dr. Baelz is one of the best and most favorably known physicians of the Orient. The above quotation is an extract of a letter from Dr. Baelz to Rev. S. C. Damon.

A recent visitor at the Lazaretto in Tracadie found the Mother Superior of the Sisters of Charity, who have charge of the Lazaretto, with her hands in the same basin of water with those of a leper, whose hands were covered with leprosy ulcers. She, the Mother Superior, was cleansing the ulcers preparatory to dressing them. There are nine Sisters of Charity at that Lazaretto who have lived there for fifteen years, engaged as nurses and caring for lepers; none of the Sisters have contracted the disease.

My authority for this statement is Rev. Father Leonor, Provincial of the Catholic Mission in these Islands. (Verbal communication.)

The following quotation is from a recent newspaper article which, from other sources of information, (on the Etiology of Leprosy, by G. Armauer Hansen, Assistant Physician to the Leper Hospital at Bergen, Norway), I believe to be a true statement:

"In a report given a few days ago by the head physician of Norway it is shown that at the end of 1856 there were known in Norway 2,863 cases of leprosy, of whom then but 235 were treated in hospitals, and 2,628 in their houses. Since then there has been steadily more isolation, and thereby a steady diminishing of new cases, so that by the end of 1866 there were 2,704 cases, and of these 795 were in hospitals, and 1,909 in their houses; a decrease of 159 cases. By the end of 1876 there were 2,008 cases, showing a decrease of 696 cases.

Since the decrease has been regular; thus there were known in 1877, 1,923 cases; in 1878, 1,835 cases; in 1880, 1,582 cases; of whom 617 were in hospitals, and 965 in their houses. Thus the decrease of this disease is from 2,863 cases in 1856 to 1,582 in 1880; in all 1,281, or 45 per cent."—*Hawaiian Gazette*, March 10th, 1883.

Summing up this statement it will be seen that, beginning with 1856, we find one case in twelve, or a little over, segregated, and 2,628 different foci of contagion—according to those who believe in contagion—engaged in spreading the disease, and yet the disease begins to decrease, so that with a gradually increasing number of cases segregated—or rather varying in number, for in 1866 seven hundred and ninety-five were segregated, and in 1880 only six hundred and seventeen—by 1880 45 per cent of the disease disappears, but still about three-fifths of the cases are at large. It has been asserted, however, that those who were living in their homes were carefully segregated.

How to make these facts agree with the assertion of the advocates of contagion in Hawaii, who so eagerly assure us that all the cases here originated from one imported case—a Chinaman, many years ago—and that the disease has spread from that one case, is a matter entirely beyond my comprehension. As we shall see further on, there is no evidence in favor of such a statement whatever.

As is well seen, the evidence of observers in other lands, who have been brought into intimate contact with the disease, and have really investigated the matter, seems generally opposed to the doctrine of contagion. Those like Dr. J. C. White, of Harvard University, who has seen one case (*Am. Journal Med. Sciences*, p. 447, 1882) or Dr. J. R. Tryon, of the U. S. Navy, who, during a visit of some weeks' duration here in Honolulu, visited the Kakaako leper

hospital three times—and in the *American Journal Med. Sciences*, April, 1883, is very sure of the contagious nature of the disease; and various observers elsewhere, who have examined the disease at a secure distance, are equally certain of it; but real, practical, earnest workers in the field, like Drs. Danielssen and Boeck of Norway, with their forty or more years of experience, say: "Among the hundreds of lepers whom we have seen daily, not a single instance has occurred of the disease spreading by contagion."

"As the result of our observations we have only to deny the contagiousness of leprosy."

And now let us turn to what we can find here in Hawaii to help us form a conclusion on the subject.

In the March number, A. D. 1883, of the "*Medical Bulletin*," published in Philadelphia, I find this statement by J. V. Shoemaker, A. M., M. D.

"I am indebted to Professor Samuel D. Gross for a recent opportunity of seeing and examining a young man suffering from leprosy. The patient was sent from Honolulu to Professor Gross by Drs. Hagan and Trousseau, gentlemen who are well known in the Sandwich Islands as expert practitioners of medicine.

"The letter of introduction, and the description of the patient's condition, stated that they believed the case in question to be one of leprosy; and, as they regarded it noncontagious, they advised a trip to the States for a change and benefit to his general health, and wished him at the same time to have the best medical advice that this country could give."

That Drs. Hagan and Trousseau did, at that time, believe that leprosy was noncontagious must have been the case, for it is entirely inconceivable that any man, and certainly any medical man, would send a person suffering with a disease that they believed contagious, to infect a healthy community; yet how to reconcile this matter with the statement in the following card, published in the "*Hawaiian Gazette*," under date of May the 23rd, same year, is beyond my ability.

"DOCTOR MATHES ENDORSED."

"*Editor Gazette*: We have read with pleasure the article of Dr. G. L. Mathes in the Saturday press of May 15th, in which he ably sets forth the difference between syphilis and leprosy, and in which he gives the views of the great pathologists and eminent medical investigators of the present day."

"We cheerfully express our high appreciation of the article, and

fully endorse the writer's views in regard to the non-identity of the two diseases. Moreover, with a knowledge of the introduction and spread of leprosy among the people of these islands, we believe the disease to be *eminently contagious*."

"As to cure, we regret to say, that nothing is yet satisfactorily established, although modern scientific investigation in different countries is tending to establish greater hopes in that direction."

"Such being the case, we recognize segregation as the only means left us to rid the country of the disease. While we realize the severity of such a measure, and do most heartily regret the necessity of its enforcement, we cannot but feel that it is the only thing left us."

"Better to amputate a diseased limb, than through a false sense of tenderness to allow it to remain and gangrene the whole body."

"G. TROUSSEAU, M. D.

"J. S. McGREW, M. D.

"J. BRODIE, M. D.

"N. B. EMERSON, M. D.

"M. HAGAN, M. D."

Many instances where foreigners, exclusive of Chinese, have lived with lepers I have seen personally. I have heard of a large number of other cases, and the result is the same. Not a single instance of contagion, or the development of the disease, has occurred among these cases, or in any of the cases that I have only heard of and not seen, among those who have been known to cohabit with lepers, except those which are doubtful. A white leper at the Settlement said he had had a multitude of native mistresses, and probably some of them may have been lepers. Another white man at the Settlement said he had a native wife many years ago who had red spots on her, and large sores. This may or may not have been leprosy. Counting these two lepers just mentioned, I have had nineteen white people under my care who had leprosy. I have carefully questioned all but two of them as to whether they had lived or been on terms of intimacy with lepers; all except the two whom I did not question, and the two whose statements I have already given, "*denied any relations with lepers, and most of them deny ever seeing a case until they were declared lepers themselves.*" The two whom I did not question were these: An aged Portuguese, with whom I could not converse, through inability to understand each other's language, and the first case I saw, which was shortly after I arrived in the kingdom, and before my attention was called to this matter. Of course, the entire nineteen may have been exposed many times to the dis-



KING LUNALILO.

Born January 31, 1835. Died February 3, 1874.

Bequeathed the bulk of his fortune to found a home for his poor and needy subjects (see page 394). The benevolent and praiseworthy act of this Hawaiian king (only a brief period removed from so-called barbarism); is in striking contrast with the deeds of the dissolute, torture-loving, assassinating and head-chopping specimens of kings, who have occupied European thrones in the not very remote past.

ease; for I doubt much if one out of fifty among all the physicians of the world would recognize the first case of leprosy they should see unless it was a pronounced case. It is frequently a difficult matter to decide positively whether a person is a leper or not. There have been several cases here lately in which physicians, thoroughly familiar with the disease, were unable to agree or come to a definite conclusion.

Turning back to instances, on June 24th, A.D. 1882, while engaged in making a post-mortem examination of a boy who had died with leprosy the day previous, I scratched my wrist on my sleeve button, and did not discover the wound until it had been covered with blood from the boy's body for a full half hour. I have never experienced the slightest bodily inconvenience from the wound. Some months ago, I regret I cannot give the exact date, Dr. E. Arning inoculated his finger while making a post-mortem examination of a leprous cadaver. I called his attention to a scratch on his finger, just as he was about to begin the operation, but he took no precautions, and as a consequence his arm shortly afterwards swelled clear to his body, and he suffered severe constitutional disturbance, but he has not developed leprosy.

Turning now to native cases. Kauuku, a mail-carrier on Molo-kai, had the palmer surface of the third finger of his left hand bitten out by a leper six years ago. He is not a leper.

It is a well-known fact that leprosy exists in a large percentage of the native race. Estimating the entire native population of pure blood at something over 40,000 and total number of lepers at 1,800 would give us four and a half per cent at any one time. I base this estimate on the fact that on October 9th, there were 723 lepers at Kalawao Settlement and 180 at Kakaako leper hospital, and from information from different portions of the kingdom, in answer to inquiries I have made.

Drs. Danielssen and Boeck state: "That the average duration of the tubercular form among the patients in the hospital at Bergen, from 1840 to 1847, was between nine and ten years, and of the anaesthetic form, among the same, was between eighteen and nineteen years."—Coll. Phys. Rep., p. LXV.

September 30th, 1884, we had at Kakaako hospital 67 married males and 36 married females—that is, where either sex were, or had been married. One married couple were in the hospital, and of the rest, three of the males had had leprous wives, and one woman a leprous husband.

No larger number of persons became lepers from inter-marriage

with lepers, than in the community at large, as these figures plainly show.

Presenting the evidence in another form. The Leper Settlement at Kalawao was inaugurated A. D. 1866. Since which time up to the 1st of April this year, 2,864 persons have been consigned there as lepers. October 9th I made a careful census of the number of the children alive who were born at the Settlement, and where either or both parents were lepers before the birth of the child.

The total number was twenty-six,^d as follows:

MALES

<i>Name</i>	<i>Age</i>	<i>Parents</i>
Kalani	8 years	Mother Leper
Mahai (is a leper)	14 years	Father Leper
Keoloewa (brother of Mahai).....	11 years	Father Leper
Kukelaile	4 years	Mother Leper
Kalaniuli	2 years	Both Lepers
Samuela	21 months	Mother Leper
Joe Kanaana	4 years	Both Lepers
Kunihi	3 years	Father Leper
Kahema	2 months	Mother Leper
Keoni	9 years	Father Leper
Damiana	9 years	Mother Leper
Keahimu	9 years	Both Lepers
Opupeli	10 years	Father Leper
Joe	8 years	Both Lepers

Total, 14 boys.

FEMALES

<i>Name</i>	<i>Age</i>	<i>Parents</i>
Keneki	2 years	Mother Leper
Kahua	8 years	Mother Leper
Kamaka	4 years	Both Lepers
Likaepaka	1 year	Father Leper
Lilia	13 years	Father Leper
*Abikaila	9 years	Father Leper
*Elikaepaka	7 years	Father Leper
Keoho	3 years	Both Lepers

*Sisters of Mahai and Keoloewa.

Hoomanawanui	11 years	Both Lepers
Kalua	10½ years	Both Lepers
Leialoha (this girl is a leper).....	9 years	Both Lepers
Mary	3 years	Mother Leper
Total, 12 girls.		

Of the total number, it will be seen that fourteen are above the age of six years, or at or above the age when the permanent teeth begin to erupt, the earliest period of life when I have seen a case of leprosy developed, and before which I do not believe it ever appears; at least it must be seldom, as I have not seen a case younger among over two thousand lepers who have been under my charge.

Two of the fourteen only are lepers, although, in addition to being born of leper parents, they have lived in the houses of lepers all their lives.

In 1866 the easterly side of the point of land projecting out into the sea from the base of the cliff, on the northern side of Molokai, was duly set apart for a residence for persons afflicted with leprosy; and the disease having been by law declared contagious, all lepers were required to remove, or be removed, to this settlement.

In 1873 the westerly side of the promontory was annexed to the settlement, but there remained several kuleanas, or homesteads, which were not purchased by the government, and the owners of these kuleanas remain on their lands to this day.

With a number, at least, of these kuleanas, or owners, it has been the custom to take lepers into their families to reside, so as to share the rations of food provided by the government for the sick; and, where this has not been the custom, they have freely commingled with their leprous neighbors, and, in two instances, have intermarried with lepers.

The total number originally of these kamaainas was thirty-eight. One of them developed leprosy before the place was annexed to the settlement, but none of the rest have become so since the annexation, a period of eleven years.

Now let us proceed to sum up the evidence.

First—The Royal College of Physicians, a body of medical men representing the highest medical intelligence of the age, deny the contagious nature of the disease, after a study of it lasting through a period of several years.

Second—Acting on the advice of this body of medical men, the secretary for the English colonies instructs the governors of the colonies “that any laws affecting the personal liberty of lepers ought to



THE LUNALILO HOME.

King Lunalilo's token of love for his aged, infirm and homeless subjects.
Opened March 31, 1883.

be repealed; and that, in the meantime, if they shall not be repealed, any action of the executive government in the enforcement of them, which is merely authorized, and not enjoined by the law, ought to cease."

The results of such action, if the disease were contagious, would seem most certainly to be a vast increase of the malady. Let us see whether this be so or not.

In the Chronicle of the London Missionary Society, March, 1884, I find the following, by Rev. James Kennedy, M. A.: "Lepers are found in all parts of India, not in such numbers as to be an appreciative portion of the population, but in such numbers as to be well known. They are regarded by the Hindoos as objects of divine displeasure, not on account of wickedness in the present life, but on account of wickedness committed by them in a former birth. While thus regarded, they are not excluded from society, as was the case with the Jews, and is still the rule in some parts of the world. They are allowed to move about, and to ask alms of those they meet. At Benares I have sometimes seen them sitting on a native bedstead with persons who, if they did not touch them, showed at least no dread of their immediate neighborhood." * * * "While Kumaun was under native rule lepers were buried alive, their nearest relatives heaping earth on them; but since the establishment of British rule, in 1815, this atrocious custom, as well as other customs equally inhuman, has been suppressed." P. 89.

Rev. J. H. Bruce, of Satara, India, writes: "I cannot find that there are any government laws whatever on the subject of leprosy. There are certainly no laws of segregation, and lepers are found everywhere in their homes and villages. There are no restrictions in regard to their marriage—there could hardly be any in this land of infant marriages. In the case of adults, *"the non-leprous party would shrink from marrying a leper."* When, however, one of the parties became a leper after marriage, there would not always, and perhaps not generally, be a separation of husband and wife. * * * We have had in our house for years a child nurse, who is the widow of a leper. * * * You ask how Vishompunt could preach and visit if he were a leper? The fact of his being a leper was well known, and never in any way concealed, yet he continued his pastoral work until within a week of his death." Letter to Rev. C. M. Hyde, D. D., published in Hawaiian Gazette, May 14th, 1884.

"I find, from the censuses of the following Provinces of 1871 and 1872, comprising nearly the whole of India, viz., Bengal, Madras, Bombay, the Central Provinces, the Northwest Provinces,

Oudh, Coorg and Mysore, that the total number of lepers then enumerated was 99,639, or 1 in 1,864 of the population; but, as I have already stated about 1 in 1,500, or 120,000, would be, I believe, nearer the truth."—P. 42, "Leprosy." W. Munro, M. D., C. M. Manchester, 1879.

Third—Segregation, except in so far as it prevents hereditary transmission of the disease, has absolutely no effect toward checking it.

(a) In India, under native rule, up to 1815, lepers were buried alive, but still the disease persisted; while under English rule, with no compulsory segregation, we find, at the most, only one in 1,500 persons a leper.

(b) In Norway it begins to decrease with only one in twelve and a fraction segregated; and by the time two in five are segregated, 45 per cent of the disease has disappeared in the short space of twenty-five years.

(c) In South Carolina the disease does not increase in forty years without segregation.

(d) In Hawaii, where a larger percentage of cases are segregated than Norway, the disease for many years increased. Although at no time within the last fifty years have less than one-half the cases of leprosy in this kingdom been segregated, and for the last two years a still larger proportion.

(e) Heredity plays but little figure in the spread of the disease, because we find that after sending more than 2,800 lepers, during a period of eighteen years, to Kalawao Leper Settlement, there are only twenty-six children alive, and only two of these children are lepers.

While, however, this disease is, as I believe, absolutely non-contagious, that fact does not do away, as far as these islands are concerned, with the need of strict segregation. * * * But carrying out the law to the letter presents almost insuperable obstacles, which no one who has not been in a position to know from personal experience can fully comprehend.

Fourth—Leprosy is an absolutely non-contagious and non-communicable disease *from a leper* to any other person by any possible combination of circumstances except by heredity.

(a) We find that seven inoculations, namely, the two cases inoculated by Dr. Bargillo, the two cases mentioned by Dr. Powell of medical men wounded in dissecting leprous cadavers, Dr. E. Arning, and myself, wounded in the same way, and also Dr. Browne, who lost his finger as the result of inoculation, and no leprosy results. These seven cases mentioned do not, as is seen, include Kauuku, the mail carrier on Molokai, who had his finger badly bitten by a leper.

(b) Husbands who have leprous wives, and wives who have leprous husbands, as is seen in the 103 cases of married persons at Kakaako Hospital, do not contract the disease in a larger proportion of cases than among the community at large.

(c) Women conceive and bear children by leprous husbands, and in some cases, first by a leper, and the children also develop leprosy, and yet the wife and mother escapes, and, as found afterward, capable of bearing healthy children by a healthy man.

(d) Food cooked by lepers and eaten by non-lepers, the clothing of non-lepers washed by lepers, and the blood and pus-saturated garments of lepers laundered by non-lepers, eating, sleeping, drinking with lepers for years fails to reproduce it.

Fifth—Those who are constantly exposed to the disease for years, as physicians, nurses and attendants on lepers, seem to invariably escape; certainly the proportion is not larger, if as large, as among the population of countries where leprosy is endemic. In fact, I can find only one case in medical history where a physician contracted it, and no nurses are mentioned as having it.

For years it has been the custom here, among those advocating contagion, to offer what to them seemed apparently an unanswerable argument in favor of contagion.

"Thirty or more years ago there were only a few cases here, and now there are hundreds; it *must* have spread from contagion. There is no other way to account for it."

In A. D. 1856, when I first went to a mining camp in California, malarial troubles were a thing unknown, but in less than ten years "fever ague" was as common, or more so, there than leprosy is here now. Yet no one thought of contagion, although not infrequently one after another would be taken down with the disease in the same place.

Very frequently a man would be taken sick with the disease, and shortly after the wife, or *vice versa*, which, according to some acute observers who write on leprosy, is a sure proof of contagion; but probably these people would not observe any sign of contagion under the same circumstances with malarial disease; but I am utterly unable to see why it is not as much a sign of contagion in one case as in the other.

As I have before stated, nineteen foreigners, exclusive of Chinese, have come under my care, having the disease, during my four years' residence in the kingdom.

All these persons with one exception were adult males, with no history in any instance of hereditary taint.

How have these parties contracted the disease?
This brings up the question of etiology.

GEO. L. FITCH, M. D.

The late Dr. G. L. Fitch, subsequent to his leaving the service of the Board of Health, made some experiments on his Hawaiian patients. With blood and serum obtained from scarified leprous nodules he inoculated some thirty males and females on the upper arm, similar to the usual method pursued in vaccination.

The Doctor claimed that all these cases had syphilis, and he proposed to demonstrate that leprosy could not be successfully inoculated, because it is or was modified syphilis in a fourth stage, hence not inoculable nor contagious. Whether this assumption is correct or not, it however furnished to my mind fresh evidence of the non-inoculability of leprosy, for no development of that disease took place in any of these inoculated people within the four years subsequent to the performance of the operation.

On a previous page of this monograph I have stated, while Dr. Fitch in Hawaii apparently promulgated new and novel views regarding leprosy, they were really not new; for as far back as the year 1858 Dr. Danielssen of Norway had recorded his work and experiences on the syphilization of lepers, and its failure to alter or modify the general features of leprosy. What was old history, and well authenticated in Norway, was introduced and palmed off on Hawaii in the year 1881 as a new and previously unknown discovery.

DR. RICHARD OLIVER.

The late Dr. Richard Oliver held the office of resident physician at the leper settlement for ten years, 1892-1902.

At the date of his death, August 12, 1902, the Doctor had resided over thirty years in the Islands, and had had a very long and comprehensive experience with leprosy on the Island of Hawaii, some twenty years. The last ten years of his life, spent at the leper settlement, added largely to his knowledge of the disease. The copious notes, memoranda and other data on leprosy, which he had accumulated, he had intended to publish; but his last illness and subsequent death prevented this. Whatever books and papers the Doctor possessed were speedily lost or destroyed soon after his death, which occurred three months after he had resigned his office at the Leper Settlement.

Dr. Oliver's long contact with leprosy in Kona and Kau, and

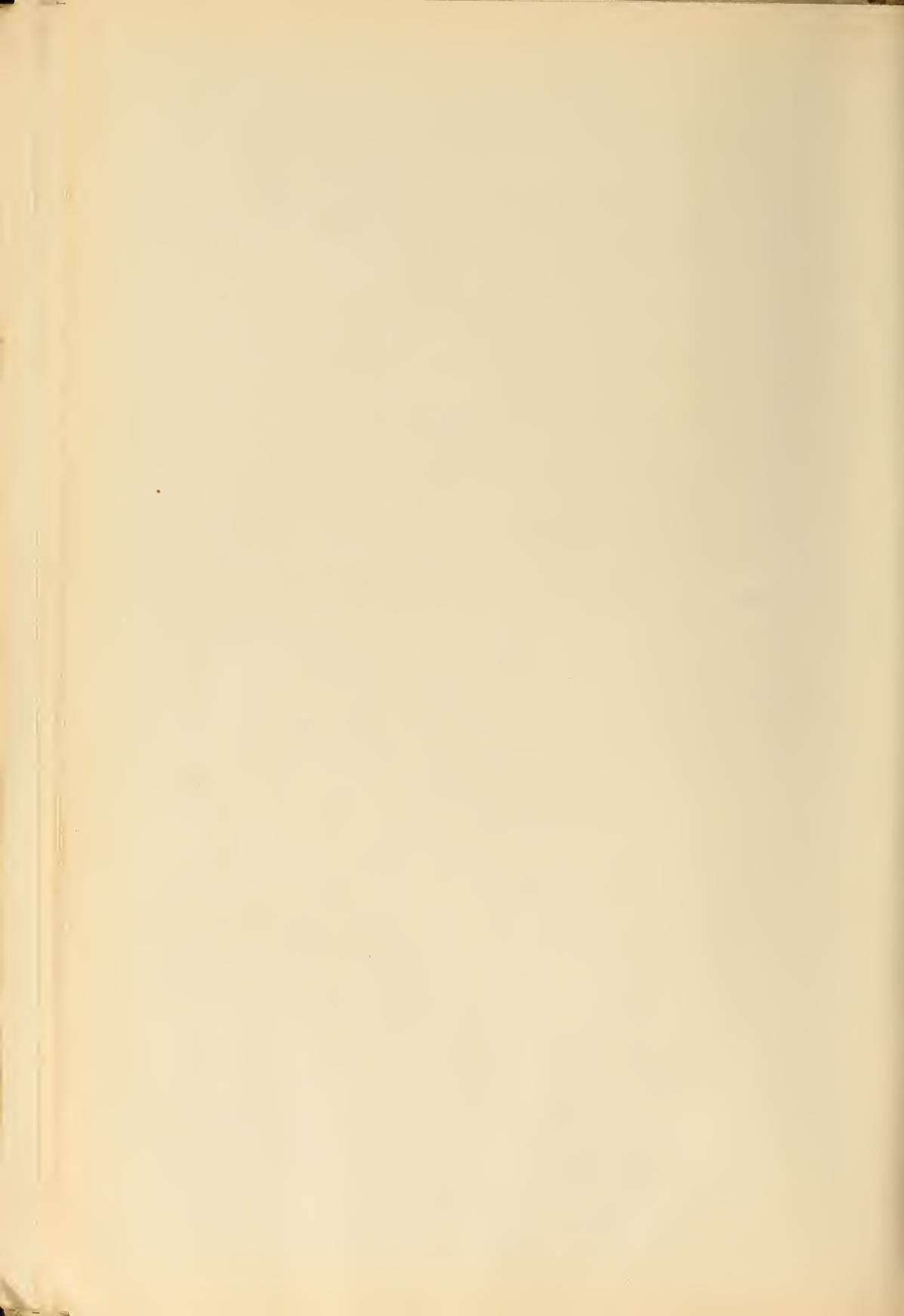
later at Molokai, where he did some experimental work, had convinced him that the inoculability of leprosy had yet to be proven. He was, however, an advocate of non-contagion, but my persistent and insidious proselytising won him over to the fold of contagion.

The Doctor had received his medical education at the medical school of Saint Bartholomew's Hospital, which is situated in the heart of the old or true City of London. It is one of the most ancient seats of hospital and monastic work; the resident monks were the hospitallers.

This hospital was founded by Rayere, a physician and monk, in the year 1102 A. D., eight hundred and fourteen years ago.

It enclosed a large and famous leper hospital within its boundaries, where some 37,000 lepers were cared for between the years 1150 and 1390, a period of two hundred and forty years.

About the year 1347 six thousand cases of black death, or spotted typhus, died within the portals of the hospital proper; and again, in the year 1665, the bubonic plague filled the hospital with some 10,700 cases, and over 90 per cent of these victims died.





NODULAR LEPROSY (Mild).

Early Stage.
The Destroyer at work.



NODULAR LEPROSY (Medium).

Advancing.

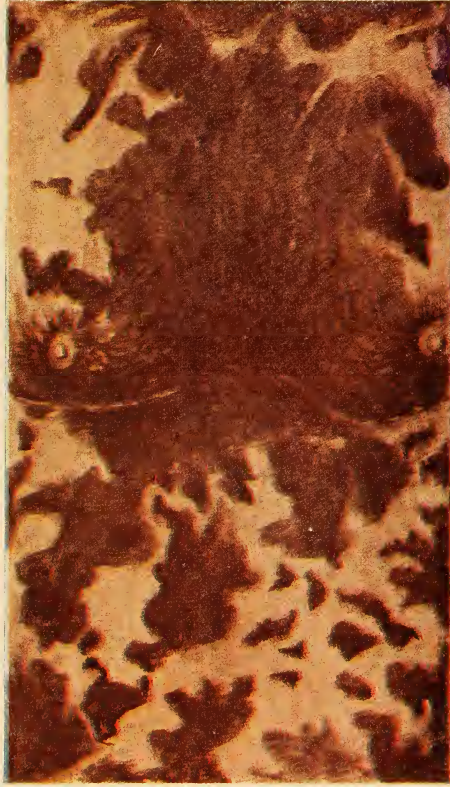
Medicines and serums fail to check the Destroyer.



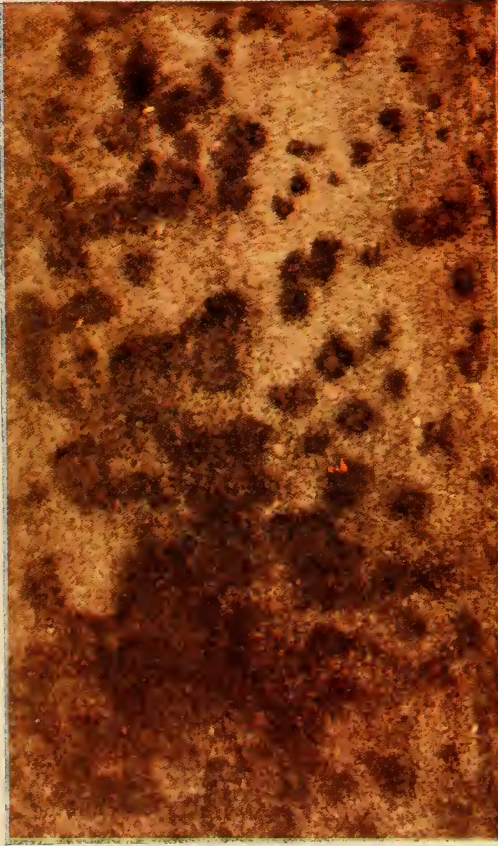
NODULAR LEPROSY (Severe).

Very Advanced.

The Destroyer actively at work.



PIGMENT DEPOSIT IN SKIN OF FEMALE LEPER.



LEPROUS MACULATION AND INFILTRATION OF THE DERMAL
TISSUES OF THE DORSUM.



NODULAR LEPROSY.

The Leper Ear.



DUAL OR MIXED LEPROSY.



DUAL OR MIXED LEPROSY.



NEURAL LEPROSY OF THE HAND.

The "Main en Griffe" or Claw-Hand.



NEURAL LEPROSY OF FOOT.

Pressure Ulcers Due to Trophic Nerve Lesions.



NEURAL LEPROSY OF FOOT.

Pressure Perforating Ulcers, Plantar Surface of Foot, Due to Nerve Disease.



LEPROUS ULCERS OF THE ILEUM.

The leprosy ulcer of the intestines and the tubercular are very similar in appearance, one may be easily mistaken for the other; the naked eye is not sufficient to distinguish which disease is present.

APPENDIX.

PART V.

LAWS RELATING TO LEPROSY.

VISITORS REQUIRE PERMITS.

No person, not being a leper, shall be allowed to visit or remain upon any land, place, or inclosure set apart by the Board of Health for the isolation and confinement of lepers without the written permission of the President of the Board, or some officer authorized thereto by the Board of Health, under any circumstances whatever, and any person found upon such land, place, or inclosure without a written permission shall, upon conviction thereof, before any district magistrate, be fined in a sum not less than ten nor more than one hundred dollars for such offense, and in default of payment, to be imprisoned at hard labor until the fine and costs of court are discharged in due course of law.

BOARD MAY MAKE RULES AND REGULATIONS.

It shall be lawful for the Board of Health, through its President, to make and promulgate such rules as may be from time to time necessary for the government and control of the lepers placed under its charge, and such rules and regulations shall have the same force and effect as a statute law of the Territory: Provided, always, that the sanction of the governor be given thereto, and that they be published in two newspapers, published in Honolulu, one in the Hawaiian, the other in the English language.

The Board of Health is hereby authorized to permit any person to engage in the treatment of lepers or of persons supposed to have leprosy. Such permits shall be under such conditions and regulations as the Board shall prescribe, and be revocable at the pleasure of the Board.

SEGREGATION OF LEPERS.

HARBORING A LEPER A MISDEMEANOR.

Whoever shall knowingly detain or harbor upon premises subject to his control, or shall in any manner conceal or secrete, or assist in concealing or secreting any person afflicted with leprosy, with the intent that such person be not discovered by or delivered to the Board of Health or its agents, or who shall support or assist in supporting any person having leprosy living in concealment, shall be deemed guilty of a misdemeanor, and shall on conviction thereof before any district magistrate, be liable to a fine of not more than one hundred dollars.

DUTY OF POLICE OFFICERS.

It shall be the duty of every police officer or deputy sheriff, having reason to believe that any person within his district is afflicted with leprosy, to report the same forthwith to the agent of the Board of Health in such district, if any, otherwise to the nearest agent of the Board of Health.

Any police officer or deputy sheriff who shall wilfully fail to comply with the provisions of the previous section shall be deemed guilty of a misdemeanor, and, upon conviction thereof before any district magistrate, shall be fined in a sum not less than ten dollars nor more than two hundred dollars, and shall be dismissed from office.

KOKUAS ARE SUBJECT TO THE BOARD.

Voluntary helpers or kokuas living with lepers segregated by the Board of Health may be by such Board declared infected with the disease of leprosy, and capable of communicating the same to others. All such kokuas are hereby placed under control of the Board of Health, and may be prevented by it from intermingling with those free from the disease.

The Board of Health, with the consent of the governor, is empowered to make and promulgate such rules and regulations in regard to such helpers or kokuas for their care, discipline and maintenance as may be deemed necessary, which rules and regulations shall have the force and effect of law when promulgated.

DUTIES OF KOKUAS.

Every kokua who has heretofore received permission, or who may hereafter get permission to go to the Leper Settlement, according to law, shall perform the duties of kokuas to their leper friends, as provided in the following sections, and in no other way.

The duties to be performed by the kokuas of the lepers shall be, that each kokua must take care of the leper or lepers that he went there to assist, and to go and get and prepare in a suitable manner all food and other supplies that are furnished by the government to the lepers, and attend to the clothing and other things that would contribute to the comfort of the lepers whose kokuas they are. And said kokuas shall also perform such labor and service as may be required by the Board of Health, when requested to do so by the superintendent of the Leper Settlement, for which services they shall be paid such wages as are deemed fair and just by the Board of Health, such wages to be not less than fifty cents per diem. And any

kokuas refusing to perform such labor, as above stated, or who shall violate any rule or regulation of the Board of Health, shall be liable on conviction before a district magistrate to expulsion from the Settlement.

CARRYING LEPERS.

No steam-coasting vessel licensed to carry passengers and engage in the regular performance of that business, according to the published schedules of sailing times, and whose net tonnage exceeds two hundred and fifty tons, shall be compelled, while so engaged, to carry to or from any port or place in the Territory of Hawaii any leper, or any person suffering from any contagious or infectious disease.

The master or owner of any such vessel knowingly violating the provisions of this act shall be guilty of a misdemeanor, and upon conviction before any district magistrate shall be fined in a sum not to exceed two hundred dollars.

Any person violating the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof before any district magistrate shall be fined in a sum not to exceed two hundred dollars.

ACQUISITION OF LAND.

The Superintendent of Public Works is hereby empowered to purchase all lands, the title to which is now held and owned by private persons within the precincts of the government reservation used for the Leper Settlement at Molokai.

In every case where no agreement about the price on such lands can be made between the Superintendent of Public Works and the owners, there shall be appointed three disinterested persons who shall appraise the value of said lands and improvements, one of whom shall be appointed by the Superintendent of Public Works, one by the owner of the land, and the two thus appointed shall choose the third member, and such appraisement shall be binding upon the parties, unless the party who may be dissatisfied with such appraisement shall, within twenty days after notice of such appraisement, appeal therefrom.

The appeal shall be taken to the Supreme Court, sitting in banco, who shall decide the question upon the testimony presented before the appraisers, and no new evidence shall be allowed to be given on such appeal. The Supreme Court may, upon such appeal, approve, reverse, or modify the appraisement; and such decision of the Supreme

Court shall be final and binding upon the parties to the controversy, and the owner of said land shall not be subjected to the payment of the costs of such appeal.

The owner of such lands shall deliver possession of the same to the officers in charge of the Leper Settlement within sixty days, after the appraisalment becomes final, and the Superintendent of Public Works shall forthwith, after such delivery, pay to the owner the sum fixed by the appraisalment or decision; and upon such payment the title to said lands shall become and remain vested in the government.

A copy of the appraisalment or decision, duly certified with the certificate of the Superintendent of Public Works, of the payment or tender of the sum appraised or decreed, duly acknowledged by said Superintendent, shall be recorded and be deemed sufficient record evidence of the change of title.

ACQUIRING LAND ON MOLOKAI FOR SEGREGATION.

The Superintendent of Public Works is hereby authorized and empowered to enter upon and take possession of and hold for the use of the government, such land, real estate, and property wheresoever situated on the Island of Molokai, in the Territory of Hawaii, as may be required by the Board of Health for the segregation and confinement of lepers, or for other purposes of the Board of Health.

Whenever the Board of Health may require any parcel of land or property on the Island of Molokai for such purposes, the President of the Board shall so inform the Superintendent of Public Works in writing, stating the location and area of such land or property so far as may be known to him, and the purpose for which the same is required, with a request that the same be acquired by the government. If upon receipt of such request and information the said superintendent shall deem the same to be reasonable and proper, he shall, after first giving thirty days' written notice to the occupants of such land or property, take possession of the same for the use of the government. Provided, however, that if such land or property is not actually occupied by any person, the said superintendent may take immediate possession of the same.

COMPENSATION TO OWNERS.

Whenever the Superintendent of Public Works shall proceed to take possession of any land or property under the provisions of this act, he shall first endeavor to agree with the owners (if known to

him) of such land or property taken, or to compromise with them, and in case of failure to agree with them, he shall appoint three competent and disinterested persons to act as commissioners and determine such compensation.

NOTICE TO OWNERS.

The commissioners so appointed shall give notice to the owners, if known to them and resident within the Territory of Hawaii, whose property has been taken or is proposed to be taken. If the owners of such land or property be known or cannot be served by reason of non-residence or other cause, then a notice posted in a conspicuous place on the land or property, or left at the owner's, occupant's, tenant's, or agent's residence, shall be deemed sufficient notice. Such notice may be in general terms and addressed to all persons interested.

APPRAISEMENT OF LAND.

Such notice shall describe the land or property taken or proposed to be taken, and state the time and place at which the commissioners will meet to hear the claimants, and take evidence as to the amount of compensation to which they are entitled. At every such meeting the commissioners shall take such testimony as they deem necessary, and they or a majority of them shall determine upon the proper compensation to be made. The decision arrived at by the commissioners shall be final and binding unless an appeal is taken as hereinafter provided. The commissioners shall have power to administer oaths, subpoena witnesses, and grant continuances in like manner as district magistrates.

The commissioners, or a majority of them, shall make, subscribe, and file with the Superintendent of Public Works, within such reasonable time as shall be fixed upon by said Superintendent, a certificate of their findings and appraisal, in which the land or property so valued shall be described with convenient accuracy and certainty.

Upon the filing of the certificate as provided in the preceding section, the Superintendent of Public Works is hereby authorized to pay to the person or persons named in the certificate, the several amounts determined upon by the commissioners, out of any appropriation available for the purpose. Provided, always, that either party feeling aggrieved by the decision of the commissioners may appeal to the Circuit Court of the First Judicial Circuit.

All appeals must be taken within twenty days after the date of

the filing of the certificate with the Superintendent of Public Works, by filing with the commissioners a written notice of the appeal, and filing with the Clerk of the Judiciary Department a bond in the sum of fifty dollars, conditioned to secure payment of future costs. Provided, however, that fifty dollars in money may be deposited in lieu of a bond.

Such appeal shall not prevent the superintendent from retaining or taking possession of the land or property mentioned or valued in the certificate.

A copy of the final appraisal or decision, duly certified by the Superintendent of Public Works under the seal of his office, shall be recorded in the office of the Registrar of Conveyances, and shall operate as a deed of conveyance in fee simple from the owners of the land or property to the Territory of Hawaii.

The Superintendent of Public Works shall, on receiving the certificate of appraisal, pay to the commissioners such reasonable compensation for their services as he shall determine upon, and he shall have power to fill any vacancy in their number caused by death or otherwise.

EXEMPTION FROM PERSONAL TAXES.

All lepers residing at Kalawao and Kalaupapa, on the Island of Molokai, are hereby declared exempt from any payment of any personal tax, or taxes upon *personal property*, owned and kept by them at Kalawao and Kalaupapa, Molokai.

AGAINST TRESPASSING AT LEPER STATIONS.

Lands at Kalaupapa, Waikolu and Kalawao, on the windward side of the Island of Molokai, have been and are hereby set apart by the Board of Health for the isolation and confinement of lepers; and all masters of vessels are prohibited from touching, receiving, or delivering passengers or freight at either of the above named places, except by special permission of the Board of Health or its agents.

Lands at Puuhale, Kalihi, Oahu, have been enclosed and are hereby set apart by the Board of Health for a leper receiving station, and all parties are hereby prohibited from entering said enclosed premises without permission of the Board of Health or its agents.

EXAMINATION OF LEPERS.

Whereas, under Sections 1122, 1126, 1127 and 1129 of the Revised Laws of the Territory of Hawaii, authority is given the Board of Health,

Therefore, Be It Resolved, That all previous rules for the examination of lepers are hereby repealed; and further Resolved, That all future examinations of any person or persons for the determination as to whether or not they are affected with the disease leprosy, shall be conducted under the following rules:

First—The Board of Examining Physicians shall consist of five physicians, appointed by the Board of Health, one of whom shall be the bacteriologist of the Board of Health and another of whom be skilled in the use of the microscope for the discovery of the bacilli of leprosy, and be designated as the assistant bacteriologist.

Second—The bacteriologist of the Board of Health shall promptly make a preliminary examination of each person coming voluntarily or otherwise under the control of the Board of Health under the suspicion of or being alleged a leper. At said preliminary examination should the bacteriologist fail to find the bacilli of leprosy present within such person, then said person shall be immediately discharged and returned to his home at the expense of the Board of Health. Should the bacilli of leprosy be found present within such person, said person shall be held for examination at the next meeting of the full Board of Examining Physicians.

Third—Each person so held shall be given one week's notice of the meeting of the Board of Examining Physicians.

Fourth—Each person so held shall have the privilege of being represented at said meeting of the Board of Examining Physicians by a physician selected and employed by such person. Should said physician object to the decision of the Board of Examining Physicians he shall do so in writing, stating his reasons therefor. Upon receipt of such written objection, the president of the Board of Health shall direct both bacteriologists of the Board of Examining Physicians to make a re-examination of such person, at which re-examination said physician may be present. They shall report to the president of the Board their findings, and he shall transmit a copy of same to the physician representing such person.

Should both bacteriologists find the bacilli of leprosy to be present within such person the decree of the Board of Examiners shall be final; otherwise such person shall be treated as a "suspect" and shall be required to report for further examination as the Board may direct.

Fifth—All persons examined by the Board of Examining Physicians shall be placed in one of the following classifications, viz: Not a Leper; Suspect; Leper.

If in the opinion of three or more of the Examiners any person examined is a "suspect" he or she shall be so declared.

If in the opinion of three only of the examiners any person is a leper, he or she shall be classed as a "Suspect" with the condition that he or she report to the Examining Board as it may direct for re-examination.

If in the opinion of four or more of the examiners any person examined is a "Leper" he or she shall be so declared.

RULES AND REGULATIONS FOR LEPERS AND KOKUAS AT THE LEPER SETTLEMENT ON MOLOKAI.

Section 1. All persons and kokuas are required to live in an orderly and peaceable manner, and to respect the laws of the Territory of Hawaii, as well as the rules and regulations of the Board of Health, and lawful orders of the superintendent.

NOT TO LEAVE SETTLEMENT

Section 2. Lepers shall not leave the Settlement except on an order from the Board of Health.

Section 3. Lepers shall not scale or climb up the palis without a permit from the superintendent, and then not beyond the limits prescribed by the superintendent.

Section 4. Lepers and kokuas shall not enter or live on the kuleanas, or in the houses owned by the kamaainas at Kalaupapa or other portions of the Settlement.

MUST KEEP THE HOUSES CLEAN.

Section 5. All able-bodied lepers are required to keep the surroundings of their houses clean, and to whitewash or cause to be whitewashed the houses in which they live, which are not painted with oil paints inside and outside, twice a year, at intervals of six months, for which lime and brushes will be furnished. On failure of lepers to comply with this rule, without showing good cause, the work will be done for them at their expense.

NOISES AT NIGHT FORBIDDEN.

Section 6. Noises after 9 o'clock in the evening and disturbances of the quiet of the night are forbidden.

Section 7. The inmates of the Homes or hospitals shall conform to the rules and regulations made by those in charge of the said Homes and hospitals, under penalty of dismissal from the same.

MAY BUILD HOUSES.

Section 8. Lepers are permitted to build houses for their own use, and to select building sites, subject to approval of the superintendent of the Settlement; provided, however, that, if at any time the Board of Health desires any such land for any purpose, the Board shall have the right to remove any house thereon to another site. All expenses of moving shall be borne by the Board, and the Board shall pay to the owner of the house all actual damage caused him by reason of such removing.

Section 9. They may sell, or give away, or devise by will such houses, but only for the use and occupation of other lepers, and with the knowledge and approval of the Board of Health.

Section 10. No leper shall be permitted to build or own more than one dwelling house.

PROPERTY LEFT BY LEPERS.

Section 11. Property left by lepers who have died without leaving a will, and who have no legal heirs at the Settlement, will be sold at public auction, and the proceeds after deducting the lawful expenses will be remitted to the president of the Board of Health, for the benefit of the legal heirs of the deceased, and if after due advertisement in an English and Hawaiian newspaper no lawful claimant shall appear, such proceeds, after deducting the expense of the advertising, shall be turned over into the public treasury as government realizations.

WILLS MUST BE WRITTEN.

Section 12. Lepers may leave their personal property and effects at the Settlement by will, but only by a written will signed in the presence of not less than two witnesses, one of whom shall be the superintendent of the Leper Settlement, or other officer authorized by the superintendent.

CLAIMS FOR SERVICES TO LEPERS.

Section 13. After the death of a leper no claim for services rendered him will be allowed, unless proofs are produced, that the deceased in his lifetime verbally acknowledged such service in the presence of a credible witness, or may have been by him acknowledged in writing, signed in the presence of the superintendent or other officer authorized by the superintendent.

Section 14. Lepers trusting one another do so entirely at their

own risk, as they will not be assisted in collecting claims by the Board of Health or the superintendent.

CULTIVATION OF LAND.

Section 15. Lepers and kokuas may cultivate their residence lots and dispose of the crops so raised, without giving a share of the same to the Board of Health, or paying for the use of this land.

Section 16. Persons desiring land outside of their residence lot for cultivation must make application for the same to the superintendent of the Settlement, stating the locality and area of the land desired.

Section 17. No person shall be allowed more land than he or she can cultivate. Any person neglecting to plant or properly care for land assigned to such person, shall forfeit all right to such land and the crops growing thereon, and such land may be assigned to another person.

Section 18. All land assigned for cultivation must be enclosed by a cattle-proof fence, for which the Board will furnish material, without charge, and the Board will not be responsible for any damage to crops done by cattle.

Section 19. No land for cultivation shall be transferred to another without the consent of the superintendent.

Section 20. Land in Waikolu Valley assigned for taro planting shall be held and used under the following condition: (a) the entire crop raised shall be delivered to the Board, which will pay for three-fourths of the same at the current market price; (b) neglect to properly cultivate, or failure to deliver the crop to the Board when ripe shall be sufficient cause for the forfeiture of all right to the payment above provided for; (c) no person cultivating taro at Waikolu shall be allowed to remain away from the Settlement over night.

KOKUAS MUST HAVE PERMITS.

Section 21. No person who is not a leper shall be allowed to live at the Leper Settlement as a kokua for lepers, without having first obtained written permission to do so from the Board of Health.

KOKUAS MUST DO THEIR DUTIES.

Section 22. Every kokua must minister to the wants and the necessities of the leper for whom he or she has been permitted to live at the Settlement.

Any kokua who deserts or neglects the leper for whom he or she

obtained the permit shall forfeit such permit and shall be expelled from the Settlement.

Section 23. All permits of kokuas terminate with the death of the party or parties for whom they have been serving as kokuas, and such kokuas must leave the Settlement on or before the expiration of two weeks after the death of such party or parties; provided, the physician at the Settlement shall, on examination, pronounce such kokuas to be free from all suspicion of leprosy.

Section 24. Kokuas must work for the Board when called upon by the superintendent, and for such services they shall be paid fair wages; provided, however, they shall not be called upon by the superintendent when the condition of the party or parties for whom they are kokuas shall demand their constant presence and attendance, for which the certificate of the physician shall constitute a sufficient proof.

Section 25. Kokuas may build houses for the party or parties for whom they are kokuas, under the same condition as lepers.

KOKUAS NOT ENTITLED TO RATIONS.

Section 26. Kokuas shall not be entitled to rations of any kind. They shall not be allowed to own horses or dogs at the Settlement.

Food rations, however, may be issued to them in lieu of services rendered to the Board, on the recommendation of the superintendent.

Section 27. Kokuas shall not leave the Settlement without the written consent of the superintendent, and then only on important business concerning the Board of Health.

KOKUAS BREAKING RULES TO BE EXPELLED.

Section 28. Any kokuas duly convicted for violating the laws or for disregarding the rules and regulations of the Board of Health, shall forfeit his or her permit and must leave the Settlement within one week after conviction, or suffer the penalty provided by law.

HOG RAISING.

Section 29. Lepers and kokuas are permitted to raise hogs at their own expense, and in such manner that they do not become a nuisance to the Settlement and injury to others, to their houses and plantings.

They are required to raise their hogs in yards or pens built by themselves, and at their own expense, and are not allowed to let them run at large.

Hogs found at large may be confiscated and sold at public auc-

tion to the highest bidder, and one-half of the net proceeds shall be paid over to the Board of Health and the other half to the owner of the hog or hogs. Hogs for which no bid is received shall be killed by some officer appointed by the superintendent of the Leper Settlement.

FIRE ARMS.

Section 30. Lepers in charge of and supported by the Board of Health of the Territorial government in the Leper Settlement at Molokai, shall not be allowed the use of spirituous liquors, except as the same may be required for medical purposes, or shall not be allowed the use of *fire arms*.

RULES AND REGULATIONS FOR THE BAY VIEW HOME FOR LEPERS AT KALAUPAPA.

This Home is for the benefit of lepers of both sexes who have become too helpless to provide and cook for themselves, and will be conducted as a boarding-house, with lodging rooms for those who may not be able to walk from outside dwellings.

Rule 1. No male leper under the age of eighteen, nor female under the age of sixteen will be allowed to reside at the Home, unless the parent of the same is an inmate.

Rule 2. No food will be supplied to an inmate of the Home, but meals will be furnished three times each day at the dining-room, or at the sleeping room, if the condition of the inmate prevents his appearance in the dining-room. Meals will be served at 8 a.m., 12 p.m. and 5 p.m.

Rule 3. Persons wishing to board, or board and lodge at the Home, must make application to the Superintendent of the Settlement or his assistant, each of whom has authority to grant or refuse such application if he considers the applicant is not a fit subject for the Home.

Rule 4. The usual clothes ration bills will be issued to the inmates, who will furnish their rooms in the same manner as those living outside the Home.

Rule 5. The inmates will be free to leave or return to the Home at any time between 6 a.m. and 9 p.m., at which hour inmates are required to retire for the night.

Rule 6. The inmates must conform with all rules and regulations of the Board of Health, and live in an orderly and peaceable manner, and each inmate must take care of his or her room if able to do so.

Rule 7. Persons living outside the Home will be allowed to visit their friends at the Home between the hours of 9 a.m. and 5 p.m., but will not be allowed to make it a daily loafing place.

RULES AND REGULATIONS FOR THE BALDWIN HOME.

"Baldwin Home" is a retreat at all times open to leprous boys and men, who, through progress of the disease, or other cause, have become helpless or partly so. This Home is not, however, to use as a convenient retreat, free boarding or lodging house for those who wish to shirk all labor.

The following regulations are issued by the Board of Health for the guidance of those conducting the Home, and for the inmates thereof, who are required at all times to give respectful obedience to the manager of the Home and his assistants.

1. All boys arriving at the Settlement under the age of eighteen, unless in the care of their own parents, responsible guardians or near relatives, competent to take charge of them, will enter the Home, and there remain during good conduct; provided that after reaching the age of eighteen it is their option to leave, if able to take care of themselves, upon obtaining the consent of the superintendent of the Settlement. While there is sufficient accommodation in the Home, the superintendent of the Settlement may permit any male leper to be admitted, if satisfied that the applicant will not be an injury to the Home.

2. Inmates will be supplied with suitable clothing, food, care and medical attendance, and when able, will be expected to perform freely such work and labor about the establishment as the manager shall require of them.

3. Inmates must not absent themselves from the Home without first obtaining permission from the manager or his assistant, and must be punctual in their return. Their conduct must be quiet and orderly, then and at all times.

4. Admission of visitors and of others from outside the Home, will be regulated by the manager.

5. Violation or disregard of the rules and regulations will be followed by suitable punishment, after due investigation by the superintendent of the Settlement.

6. Persistent disobedience, insubordination or disorderly conduct will debar an inmate from the privileges of and cause his expulsion from the Home.

7. The manager shall make report to the Board of Health, from

time to time in writing, regarding any conditions that may arise calculated to affect the interests of the Home.

8. No horse, nor cart, nor any tool, nor any property whatsoever, belonging to the Home, may be loaned or taken for any outside purpose without an order from the superintendent of the Settlement.

9. The superintendent or acting superintendent of the Settlement will make an inspection of the Home once each week.

RULES AND REGULATIONS FOR THE BISHOP HOME.

The "Bishop Home" has been established for girls of all ages and unprotected females, married or unmarried, who, having contracted leprosy, have become helpless and have no relatives at the Settlement able properly to care for them.

1. The inmates of this Home will be supplied with all things necessary for their comfort and will be carefully cared for by the Sisters. They are required to observe the rules and regulations of the Home; to be obedient and respectful to the Sisters in charge and to perform light work suitable to their strength.

2. For substantial services, if they are capable and willing to perform them, they may be remunerated by the matron in charge as agreed upon between her and the superintendent of the Settlement.

3. It is compulsory for girls arriving at the Settlement under the age of sixteen years, to enter the Home, unless they have parents, near relatives or guardians at the Settlement who are competent to, and who will take proper care of them.

They shall remain at the Home until they reach the age of sixteen years, after which they may, if they prefer, leave the same upon making their wishes properly known to the matron in charge and to the superintendent of the Settlement.

4. The inmates are not allowed to leave the Home at any time without previously obtaining the consent of the matron; and they must return according to the rules governing the Home.

5. Visitors to the inmates will be allowed admission to the Home after having first received permission from the matron.

6. Violation of the rules or regulations will be followed by suitable punishment, administered by the superintendent of the Settlement after due investigation.

7. Any inmate may be dismissed from the Home for disorderly conduct.

8. Inmates shall not be received at the Home nor dismissed from it without the approval of the superintendent of the Settlement.

9. The superintendent or acting superintendent of the Settlement will make an inspection of the Home once each week.

RULES AND REGULATIONS FOR KALIHI STATION.

1. Segregation.—No inmate of the hospital shall be allowed outside of the enclosure surrounding the hospital grounds, except by permission of the executive officer of the Board.

2. The keeper and patients are under the immediate direction and control of the medical superintendent.

Duties of the medical superintendent are to see that the rules of the hospital and experimental station are carried out; to make requisition for all medical supplies and material, and to approve bills for the same; to have the management and control of the laboratory, including all bacteriological and microscopical investigations necessary for diagnosis and treatment, and to conduct the medical and surgical treatment of the inmates.

4. The duties of the keeper are to see that the discipline and rules of the institution are carried out, and that the routine prescribed by the committee and medical superintendent is followed.

5. No visitors shall be allowed entrance, except with the permission of the executive officer of the Board.

6. The inmates are expected to submit faithfully and cheerfully to the rules and regulations of the experimental station as a condition of their enjoyment of its benefits.

REGULATIONS FOR VISITORS TO THE LEPER SETTLEMENT AT MOLOKAI.

The superintendent of the Leper Settlement at Molokai is hereby directed to have set apart a parcel of land of about half an acre in area near the landing at Kalaupapa, the same to be enclosed with a double fence, together with entrance thereto, so that persons may reach said enclosure and remain therein without being able to come in personal contact with any inmate of the Settlement. In the enclosure shall be provided suitable buildings for the convenience of those who shall have occasion to use them. This enclosure shall be known as the visitors' compound, and no leper shall be allowed within it.

2. The superintendent of the Settlement is hereby directed to admit no one to the Settlement without a permit authorized by the Board of Health, and to keep an accurate record of all who shall enter.

3. Officers of the Board of Health, or of the Federal or Territorial government whose duties shall require their presence at the Settlement, may obtain permits from the executive officer of the Board.

4. Lepers regularly committed by the Board of Health shall be accompanied by a complete list, giving name, sex, age and nationality of each person.

5. Persons having friends or relatives among the inmates of the Settlement, or anyone having business to transact with any inmate, may obtain from the executive officer of the Board a permit to visit the Settlement (upon showing good cause), which permit shall allow the holder to go upon any regular trip of the steamer to Kalaupapa, at his own expense, but he shall only be allowed to remain on shore during the hours of daylight that the steamer remains in port, and while on shore shall be obliged to remain in the visitors' compound. Such permits shall be good only for the trip designated.

6. No other persons shall be allowed to visit the Settlement, except as permission is authorized by a vote of the Board of Health.

7. The executive officer of the Board shall keep a correct record of all permits issued.

REGULATIONS RESCINDED.

All regulations of the Board of Health not included among the foregoing are hereby rescinded.

PENALTY.

Every person who shall violate any regulation of the Board of Health, after the same shall have been published, shall be fined not exceeding one hundred dollars.

DOGS.

No leper or person residing in the Leper Settlement at Molo-kai shall have the right to keep more than one dog.

It shall be the duty of the superintendent to see that this section is enforced.

This section, however, shall not go into effect until the first of July, 1903.

RULES AND REGULATIONS FOR LEPERS AND
KOKUAS LIVING AT THE SETTLE-
MENT ON MOLOKAI.

INTOXICATING BEVERAGES.

No person residing in the Leper Settlement, Island of Molokai, shall have the right to manufacture, brew, or in any way make an intoxicating beverage; or to have in his possession, custody or control, or to sell or to dispose of in any way, what is commonly known as "Swipes."



AN ACT

PROVIDING FOR THE CARE AND MEDICAL TREATMENT OF PERSONS AFFLICTED WITH LEPROSY.

Be It Enacted by the Legislature of the Territory of Hawaii:

Section 1. *Hospital.* There shall be established at and on such place on the Island of Oahu, Territory of Hawaii, as the governor shall direct, a hospital for the care of persons afflicted with leprosy, there to receive such treatment as shall be provided or approved by the Board of Health.

Section 2. *Treatment at Hospital.* At such hospital every reasonable effort shall be made to effect a cure of the patients, and such patients shall be cared for as well as circumstances will permit and given such liberties as may be deemed compatible with public safety. They shall be treated by such licensed physician or physicians as the Board shall designate, but if any patient so prefers, he may be treated at his own expense by a licensed physician of his own selection under such conditions as the Board may prescribe. Any person may, at any time, secure free of charge at such hospital, an examination for the purpose of determining whether or not he is a leper, and in case he is found not to be a leper, the Board shall, upon request, furnish him with a certificate setting forth such fact, the date of examination, and the name or names of the physicians making such examination.

Section 3. *Notification.* Every person who knows, or has reason to believe that he, or any other person not already under the care or control of the Board of Health, is a leper, shall forthwith report to the Board or its authorized agent, that fact, and such other information relating thereto as he may have and the Board may require.

Section 4. *Examination.* Any person so reported, or otherwise believed to be a leper, may be examined at any time and place and by any physician or physicians that may be agreed upon by him and the Board or its agents.

The Board or its agents may, however, instead request such person to appear at a designated time and place not less than five days thereafter, and then and there to submit to an examination by

a designated physician for the purpose of ascertaining whether such person is a leper.

If, however, such person prefers such examination to be made by more than one physician, he may so notify the Board or its agent at any time so designated and may at the same time, or within such further time as the Board or its agent may allow, designate to the Board or its agent one licensed physician, in which case the Board or its agent shall within five days thereafter designate to such physician a second licensed physician, and at the same time so notify such person and such second physician, and the two physicians so designated shall within five days thereafter designate to the Board or its agent a third licensed physician, and if they fail to do so, such third physician shall be designated by the Circuit Judge of the circuit in which the examination is to be held, and in the case of the first circuit by the First Circuit Judge; and in case such person shall fail to designate a physician within the time allowed, all three physicians shall be designated by such judge; notice of any such designation or designations by a judge shall be given forthwith to such person, and to the Board or its agent; when the three physicians have been so designated, such examination shall be made by them or a majority of them at a convenient time and place designated by the Board or its agent, reasonable notice of which shall have been given by the Board or its agent to such person and such physicians.

The physician or physicians who make the examination shall report to the Board or its agent whether in his or their opinion such person is a leper.

If such person is under the age of sixteen years, his parent or guardian, if any, may exercise such preference and thereafter represent such person as far as may be for the purpose of this section.

If upon such examination such person is found not to be a leper, the Board shall furnish him, or her, upon request, a certificate setting forth such fact, the date of examination, and the name or names of the physician or physicians making the examination.

Section 5. *Transfer to Hospital.* If upon such examination such person is found by such physician or physicians or a majority of them to be a leper, he shall be transferred by the Board or its agent to such hospital. If he shall refuse or fail to appear and submit to any such examination at the time and place designated or agreed, he may be arrested and taken to such hospital upon a warrant issued by any circuit judge or district magistrate upon a sworn complaint setting forth the necessary facts, and shall there be examined as near

as may be as provided in Section 4 of this Act. All lepers at such hospital shall remain in the custody of the Board, and its agent, until discharged or removed by its direction or permission.

Section 6. *Removal to Settlement.* Any leper may be removed from such hospital or any other place to the Leper Settlement at any time with his consent; but no leper shall be so removed until he has been at such hospital for at least six months, unless, in the opinion of at least three licensed physicians he cannot be materially benefited by further treatment there, provided, that any leper whose custody it has been necessary to obtain by arrest or who is unwilling to receive such treatment or to submit to such rules and regulations as the Board may approve or prescribe, may be so removed at any time. When so removed he shall remain in the custody or control of the Board until lawfully discharged.

Section 7. *Discharge.* Any person detained as a leper, whether at the hospital or at the Settlement, shall be released whenever the Board shall be satisfied in any way that he is not a leper. Upon the request of any such person at any time not less than one year after any previous examination, he shall be examined by three licensed physicians to be chosen in the manner provided in Section 4 of this Act. A decision by a majority of the examining physicians that he is not a leper shall entitle him to a discharge.

Section 8. *Expense Rules.* The Board shall bear all expenses of travel and other necessary expenses incurred under this Act, and may prescribe all rules, regulations, and forms, and perform all acts necessary and proper for carrying out its provisions.

Section 9. *Penalty.* Any physician, or police, or other officer who shall violate the provisions of the third section of this Act shall be liable to a penalty of not more than One Hundred Dollars, and in addition thereto forfeiture of his license to practice, or to removal from office, as the case may be.

Section 10. *Repeal.* Sections 1122 and 1122A of the Revised Laws, and Act 122 of the Laws of 1907 are hereby repealed.

Section 11. The sum of Forty Thousand Dollars is hereby appropriated, out of moneys in the treasury, received from the general revenues, for a hospital to be erected under this Act.

Section 12. This Act shall take effect upon its approval.

Approved this 14th day of April, A. D. 1909.

WALTER F. FREAR,

Governor of the Territory of Hawaii.

Act of 1870, Chapter XVI, Relating to Divorce.—

Section 1. Divorces from the bond of matrimony shall be granted for the cause hereinafter set forth, and no other:

First—* * * “And when it is shown to the satisfaction of the court that either party has contracted the disease known as Chinese Leprosy , and is incapable of cure.”

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